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THE ETHICS OF PACIFISM

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EVERYBODY is to some extent pacific, as everybody prefers to attain his ends by peaceful means if he can. Even the most bloodthirsty militarist uses threats of war rather than war, if threats will do the work. Though most people prefer persuasion to violence and peace to war, they are prepared as a last resort to go to war and use violence, when that seems the only means to attaining some end they consider to be of vital importance. The one hundred per cent pacifist, however, refuses to engage in war or support warlike action under any circumstances whatever. It is his case that I wish to consider. It is not my purpose to try to persuade anyone to be a pacifist or to be the opposite, but to point out that absolute pacifism carries with it certain logical consequences which are not particularly palatable. The opposed view, which I shall call the case for civic virtues, also carries unpalatable though different consequences. These two appear to be simple and clear-cut opposed views which I propose to state as fairly as I can, with their consequences. Certain qualifications and modifications will have to be considered later, but I do not think that there is actually any possible mean position which avoids the dilemma I am concerned to present. I shall state the case for civic virtue first and the pacifist case second.

The discussion turns upon the alternative policies of using persuasion or violence. The pacifist argues that only persuasion is morally permissible; his opponent that violence is sometimes permissible. These terms must, however, be used with caution and with certain qualifications if fallacies are to be avoided. The threat to use violence might be called persuasion. Persuasion by systematic lying is really a kind of violence—a violence to the soul. At any rate, I doubt whether any sincere pacifist, who bases his pacifism

on moral grounds, would see much to choose between the two methods, and most others would consider deception worse than open violence. But with this warning in mind there should be no difficulty in distinguishing genuine persuasion from force or violence.

It is necessary at the outset to distinguish between the organized large-scale violence which is war, internal or external, civil or international, on the one hand; and on the other private violence or the use of violence by the police. In a well-ordered community governed by law the police are authorized to use a necessary minimum of violence against those who by violence are breaking the peace. This is necessary to maintain peace and justice because there are a few recalcitrant individuals who can be suppressed only by violence and who if not suppressed are an intolerable nuisance and may even produce anarchy. This kind of violence is not unjust given certain conditions; namely, that it is done in accordance with law, that there is an independent tribunal to judge the case, and an authority to punish the policeman who abuses his authority as well as those whom he arrests. The system is justified solely by its success; that on the whole the peace is kept. To keep the peace is in the interests of practically everybody always, and usually even in the interests of those few who may wish at times to break it. The burglar does not wish to be robbed by anyone else or to be assaulted while he is walking abroad. Moreover, when there is a breach of the peace and the police are not strong enough to quell it or are not there to quell it, the private citizen may, and by English Law must, himself take the part of the police and use the same violence, with exactly the same limitations.

There is a difference, of course, between the use of violence to coerce and the use of violence to kill. But use of violence to kill is justified under similar conditions if it is used to prevent killing. That is to say, if the potential murderer cannot be restrained except by killing him, it is not unjust to kill. An innocent life is worth more than a guilty one. But here again success is necessary for justification: it is the rarity of crime more than its punishment which redounds to the credit of the police. At the moment I am only defending the use of killing to prevent killing and not the use of killing as a penalty. That is another and more difficult problem which fortunately I can ignore for the present. Let me emphasize the point. Violence even to the point of killing is compatible with justice, but only under the conditions mentioned; it must be done to preserve the peace and be successful on the whole; be done in accordance with law, under the jurisdiction of an independent court and a civil authority to enforce the court's decisions; the court must be able to punish excesses on the part of the police. Unless all these conditions are fulfilled it is unjust.

So much I believe the absolute pacifist might be prepared to accept. The strength of his case against war rests, not upon its violence but its injustice. In war each party is judge in its own cause; there is no impartial tribunal and no authority to enforce decisions. There may exist rudiments of a system of international law, but without the tribunal and the authority they remain rudiments; this applies equally to civil war and international war. It is the innocent who get killed in war rather than the guilty. Lastly, in war the decision is in favour of the winner irrespective of the justice of his cause. It has been argued that justice always triumphs in war, but the historical truth of this view is not obvious and even when it is true it may be an accident. To put the issue in a sentence: the pacifist argues that because war is unjust in the sense considered it is necessarily wrong: his opponent argues that although war is unjust it may be a means to avoid greater injustice. It must be remembered that to be prepared to use the means of war as a last resort is not the same thing as believing that war is in itself justified, is a proper end of action, as the genuine militarist does. The militarist's case is not worth stating, and need not delay us.

Let me now try to state the case for civic virtues as well as I can, taking it first from the point of view of the government and secondly from the point of view of the individual citizen. No government can dispense entirely with the use of force, even to the point of killing, because its first duty is to govern; namely, to preserve peace and order by quelling actual and possible disturbances within and also without. The government uses force not only against individuals or minorities who would disturb the peace but also to protect unpopular minorities who might suffer from mob violence with the acquiescence of the majority. In this country they might be Communists or Fascists, or possibly Pacifists. However, the second duty of the government is to govern well or justly, so as to give its citizens no proper cause to wish to break the peace. The better it governs the less force it needs, and good government means secure government. Because force ought to be kept in the background that does not mean it can be dispensed with altogether. However benevolent governments may be, a few individuals will always wish it were not there and break the peace if they dare. Peace and order come first, justice second. In all matters where the government as such is really impartial there is no difficulty about securing justice, but where it is a question of the citizen (or group of citizens) versus the government it is harder. One of the unsolved political problems is how to curb the powers of government, so that it shall do no injustice to individuals without crippling its power to act when action is needed. So much for internal affairs.

In external affairs similar principles apply. No government while it remains in power can submit to external threats any more than to internal ones. Here again persuasion is always better than force, and gives greater security, when it can be used. But force is always present at least in the background. As long as there is international anarchy it remains in the foreground and international justice is an empty phrase. Nations in fact live in Hobbes's "state of nature"; with the consequences he so vividly described.

In certain emergencies governments must count on the active support of every citizen, even though they cannot expect support of their policy in all things. It is a necessary part of democratic government that criticism should be freely and openly expressed and within legal limits freely and openly organized. Any government that refuses to allow criticism is thereby confessing its weakness and insecurity. But no government without abdicating its functions can allow an open breach of the peace or an open threat of it to pass unchallenged. It was, for instance, a fatal weakness of the German governments from 1919 to 1933 that private armies were not suppressed. Violence or threats of it must be met with superior force and when a breach of the peace threatens no government can admit that individuals have an inherent right to remain indifferent; it must assume their active support. This applies equally to threats from internal and external enemies. I am not saying that every government acts rightly; only that any government which does not act on these assumptions is on the way to forfeiting its authority. Possibly it may be right for it to forfeit its authority, but that is another matter.

If there are any who on grounds of pacifism refuse this active support, the government is probably wise to leave them alone. If they are few and not very influential and if the government is secure in the support of a large majority, that is of course the best course both on grounds of expediency and moral principle. On the other hand, if they are numerous or influential, or the government is not very sure of its popularity, it may have to take some action against them. The principle on which such action can be justified is that the citizen's first duty is to help in preserving or restoring peace and order, so that anyone who refuses to do this forfeits his rights as a citizen—without duties there can be no just rights. The government has to assume it is acting justly and in the public interest. The very difficult question of how much free play ought to be allowed to criticism and active or passive opposition cannot be discussed here. Perhaps I may be allowed to state baldly the paradoxical conclusion, as it appears to me. Weak governments cannot afford to give rein to criticism or opposition, but, if they are to survive, must suppress it, though suppression may be difficult and dangerous. Strong govern-

ments are in a position to suppress criticism and opposition quite easily but they have no need to do so, in fact ought to give it free play. If a policy is wise free criticism makes its wisdom more obvious: if a government is secure full liberty for legal and peaceful opposition can only increase its security. The strength of governments depends less upon forms and institutions than upon the common interests of its people and their active political interest and political education, all of which depend on free discussion.

One further remark at this stage: the art of government, as it has been said, is a perpetual search for the second best, for fear of falling to the third or fourth best or worse. In the tangled state of human affairs the best is usually out of reach, though arm-chair commentators can talk about it. Those who are in authority and responsible for policy feel a quite natural exasperation when they are blamed for not attaining the unattainable. On the other hand, it is good for those who enjoy political power to be criticized or they become too pleased with themselves. Official complacency is the first and most fatal step on the downward path that leads to inefficiency, corruption, and tyranny.

Consider now the point of view of the individual citizen. For people to live together requires a perpetual process of adjustment and compromise between conflicting desires and aims. Each is a member of the community in so far as he both gives and receives; gives in the way of services to his fellows and receives services in return. All social, political, and economic relations whatsoever, by whatsoever high-sounding abstract names they are called, boil down to relations between individual human beings. Smith does something and Brown is harmed or benefited by it. Brown in his turn and partly in consequence of Smith's action does something that affects Robinson's welfare, and so on throughout the whole community. The principle of justice and of right requires that there should be some proper balance between what each one gives and what he receives, between his duties and his rights. (The principle is stated by Aristotle, when he says that justice is a kind of equality as between equals but proportionality as between unequals, and in another form by Hobbes in his first three "Laws of Nature".) It is useful where possible to interpret the principle in terms of equality, but very often it is not possible because the notion of equality, which is really a metaphor when applied to social matters, is not applicable. "Equal pay for equal work" seems a sound rule, so does "Equal pay for equal needs"; but one cannot have both at once if different people do different work and have different needs and responsibilities. The only universal rule is that rights and duties should be in some way mutual and reciprocal. I have no right to receive except in so far as I am giving something. As between individuals, where

duties are equal, rights are equal and only if duties are greater can rights be greater.

Acting on this rule, no citizen, merely as such, can justly claim to be exempt from duties that are performed or obligations that are acknowledged in general by his fellows. If it is the general duty of citizens to serve in the army or at any rate give some active support to the government against internal or external violence, then no one can claim exemption unless by reason of special duties or because he surrenders some common rights, does not claim full citizenship, or else has not received common rights. Examples of the first are that medical men are never called upon for combatant duties, and the custom in some countries of exempting the only sons of widows. This last is not mere sentimentalism but a recognition that they have certain responsibilities not borne by young men with fathers and brothers. This is markedly the case in non-industrial communities where the family is the economic productive unit.

The second reason for exemption is more complicated but more relevant to the present discussion, and is perhaps best dealt with in terms of a historical example. The early Christians, though they lived in the Roman Empire, did not, whatever their legal status, feel themselves to be citizens in any complete sense. Public service was too closely wrapped up in idolatry. The government as a whole appeared as an alien power conferring no rights of any importance and even spasmodically persecuting them. The Christians therefore felt no obligation towards it. They may have been unfair to the Empire, but that is not the point; the point is that they did not consider they had any special obligations. Actually the Roman government was peculiar in that it relied on a professional army and made no claim on the ordinary citizen beyond payment of taxes. However, one can be sure that if the Christians had been called upon for military sevice they would have refused. Certainly they had grave doubts whether a soldier could be a Christian as long as he was actually serving. After Christianity obtained official recognition under Constantine, the state of affairs was entirely altered. The Christian became a responsible and integral part of the State and could no longer repudiate obligations of citizenship. Absolute pacifism ceased to be considered an obligation, and it came to be admitted that a man could be both a soldier and a Christian. There has always been, however, some hesitation about this question in Christian tradition. Hence the standard evasion that a Christian may fight in a "just" war, leaving it undecided how to distinguish "just" wars from others and leaving open the possibility that there are no "just" wars. Those who have decided in favour of military service have done so, I believe, on the principle that it is a common obligation of citizenship, a necessary return for benefits conferred. Those

who have decided against have done so because they considered that a Christian was not primarily a citizen but owed his first allegiance to something outside the system of the State.

A different type of case is the one where exemption might be claimed on the ground that common rights had been withheld. Thus in the present world a young man who had been unemployed since he left school could very reasonably claim that he was under no obligation to serve in the army of a country that had so neglected him.

To sum up, the civic virtues arise from the feeling of solidarity with one's fellows; that this country is my country and its cause my cause. If these are the primary virtues, then refusal to fight for one's country is in general wrong; it means claiming rights without fulfilling corresponding duties. If anyone refuses it will be because the feeling of solidarity is lacking. The positive ground for this must be that there are higher virtues than the civic virtues and more urgent duties than the civic ones. However, the man who refuses must be prepared to suffer for his refusal. The negative ground that rights have been refused or claims insufficiently met is perhaps less important.

The chief moral difficulties met with in deciding on a course of action arise from conflict of duties or conflict of goods or ends. The hardest of these arise out of conflicting loyalties. We mostly find ourselves members at the same time of different groups, societies, or communities, and when the interests of these clash it is never easy to decide which loyalty should prevail over which. The most frequent and perhaps the most painful of these conflicts are those where duty to one's family clashes with duty to some other group or to society as a whole; as, for example, where a man in business has to choose between doing something dishonest or losing his job and ruining his family. It is necessary to emphasize this because it is too easily and too often assumed that the path of duty is always clear and simple and that we never have to choose between two evils or two conflicting goods. The difficulties surrounding civic duties are of this kind. The man who desires to be a good citizen must to some extent surrender his conscience to the keeping of the government. He must be prepared to support the actions of the State with his life and property, even though at times he disapproves of them. The old catch-phrase "My country, right or wrong!" is a caricature of civic loyalty, but does express clearly the nature of the problem. The problem is all the more difficult because to some extent it is not a matter of choice but of necessity. Anybody living in a country, paying its taxes and obeying its laws, is involved in its political system, and is co-operating in its policy to some extent. It is not easy to refuse this co-operation short of going to prison or leaving the country to live in a desert island.

In a country with free democratic institutions (if such a country

exists) where criticism of government policy can be fully expressed by legal methods and can lead to a change of policy or change of government, those who object to existing policy may be considered to have had the chance of converting their fellows to their own point of view. If they have failed to convert more than a small minority, that is to some extent a condemnation of the criticism. How far it is really a condemnation depends upon how far we can assume that men are in general reasonable and how far the institutions of the country concerned are effectively free and democratic. If we took the most favourable view possible of human nature and political institutions it would be a complete condemnation; even if not theoretically complete, sufficiently so for practical purposes. Therefore in that case the minority ought in matters of urgency to acquiesce in and indeed support the majority decision until such time as they can turn themselves into a majority. This is, of course, a hypothetical case; one cannot assume any democracy actually works so well. The opposite extreme is not unfortunately hypothetical at all. Where there is autocratic rule and no free expression of opinion, those who object to government policy are restrained by force and force only. They cannot therefore be blamed for taking any action that is likely to alter the government or its policy. Rulers who remove their opponents and critics by assassination have no reasonable ground of complaint if they themselves are removed in the same way. This much may be said without implying an unqualified approval of tyrannicide as a political method.

What has just been said brings up another aspect of the paradox already mentioned. When the government rules by force and terror, its subjects are morally entitled to resist it to the uttermost. In such a country the mere expression of pacifist views will lead to death, torture, or at the very least imprisonment, and pacifism may well appear as the supreme form of heroism. Where the government rules by persuasion as far as possible instead of force and the expression of opinion is free, open disobedience whether passive or active is harder to justify. In such a country there is some plausibility in the common view that the pacifist is merely a crank. Still one has to ask the question: in the freest and most democratic State, is the individual morally obliged to obey all orders of the government under all possible circumstances? Government exists for the service of the individuals who compose the State and such a government must openly admit this principle. Government is only a piece of machinery: a means and not an end. It is only individuals who are moral agents and ends in themselves. Solidarity with one's fellows and loyalty to the State are desirable and important aims, but they are not the only ones. So here is a loophole for the pacifist, whose case must now be stated.

I am assuming it to be true as a matter of fact that absolute pacifists are few in numbers and always have been. Most people have no fundamental objection to the use of violence and of warfare if they are persuaded it is used in a good cause and most people think their own country's cause is a good one. Few people are capable of rebelling unless many others are rebelling too along with them, so that the feeling of solidarity with their fellows is not lost. The pacifist is a sort of rebel, though admittedly a harmless sort: he is also a lonely rebel.

I admit that matters would be very different if pacifists were numerous and if governments were likely to abjure the use of force. But I believe that things are as stated, and there is no need to pursue possibilities that are not likely to be realized. Indeed, I cannot see how any government can abjure the use of force and remain a government. For them to say "We will never use force under any circumstances" is to invite criminals to take control. To say "We will never use force against external aggression" is to invite any Hitler, Stalin, or Mussolini on the look-out for easy conquests. The lion is reported to have said that he had no objection to lying down with the lamb, as long as there was plenty of lamb. Governments cannot afford to be lamblike.

If the pacifist's case rested upon the assumption that he was proposing an immediately practicable public policy, he would hardly have a case at all. If it rested upon the assumption that the use of force under the conditions of law and justice within the State was wrong, it would be a weak one. But it need not rest upon either of these assumptions. It insists upon the point already mentioned, that war is a denial of justice. War denies to the enemy what any man owes to another simply as a man, the right to have his case heard and impartially judged. It is tantamount to denying the humanity of the enemy and treating them not as ends in themselves but merely as means. While the injustice may be far greater on one side than on the other, there is injustice on both sides. In ancient times the logical consequences of war were understood and acted on. Those who were defeated were massacred or enslaved. More recently we have become more squeamish and less logical, and want to enjoy the advantages of warfare without some of its horrors.

The argument that persuades the ordinary decent man to be prepared to go to war is that the safety of the State depends upon it, and that the State is *his* State, to which he is bound by ties of duty and affection (and, after all, the others are only foreigners). The pacifist's reply must be that if the safety of the State depends upon injustice, then the State is none of his and is not worth saving. A man might say this out of sheer despair for humanity. But despair alone should lead him, strictly and logically, to say it makes no

difference whether a man fights or not. The pacifist's refusal must be based on despair of the State but faith in humanity; faith that there are things that matter and that refusal to do injustice is one of them. This means that he takes an other-worldly or religious view of the ends of human action. He breaks the laws of men to keep the laws of God. If God has a purpose in the world, then in his view nations and states and governments are at present no part of it. If the State is founded and maintained by the sword used without justice, let it perish by the sword. The ends of the State are purely material and at best indifferent. If the State asks him to do anything that is harmless in itself, then of course he will do it for the sake of peace and quiet. If it asks him to do anything wrong he will refuse and be prepared to take the consequences. He is concerned only with the integrity of his own soul and the example he gives his fellows, by martyrdom if necessary. His action is a protest against conventional morality in favour of an ideal of justice. The pacifist has no need to consider whether or not his ideal can be realized now or at any time.

There are two objections to be met. First the objector to the pacifist will say: granted that men should be treated as ends in themselves, that only holds good while they behave like men, that is to say treat others in the same way. Nobody may claim for himself what he refuses to others. If therefore we are attacked by force or fraud our assailants have by their action put themselves outside the pale, and it is in accordance with the principle of justice to treat them with their own medicine. If we kill them their blood will be upon their own heads.

The pacifist has two arguments in reply. First he can point out that in war everybody always believes that his is the innocent and injured party and the others the aggressors; just as in family quarrels every member of the family discovers long lists of injuries the others have inflicted on him. Each side in war claims to be acting in self-defence. The verdict of history, however, does not always bear out these claims.

The second argument is much more important, though not easy to state simply. Granted that nobody can justly claim for himself and his friends what he refuses to others, that is merely the absolute minimum. The man who claims more is positively wrong, but the man who claims for himself strict equality or reciprocity is not positively right, he is neutral. Positive morality always implies rendering more and claiming less. The aggressor has by his action put himself in the wrong, but by meeting wrong with wrong you do not put yourself right; you can only do that by treating him better than he deserves. This has been recognized for centuries in private morals, and has not only been recognized but acted upon, because

men's natural affections lead them to treat better than they deserve those for whom they feel these affections—relatives, friends, and fellow countrymen. Men's affections, however, are limited and spasmodic and never extend far enough. They tend to repudiate the claims of those beyond the usual circle of their affections. The pacifist's protest is directed against these indefensible limitations.

Laws, customs, and ordinary moral rules represent the level at which almost everybody is prepared to act or, at least, says he is prepared to act and below which very few openly fall. But this level is much lower than the one the more enlightened try to attain, and really represents neutrality rather than positive morality. Positive morality is progressive; it means doing better than has been done before, and it is the result of the acts and protests of the saints and prophets. What saints do and prophets preach is never practical politics in their own day; hence their unpopularity. With luck, though, it may become the practical politics of a later day. After a long interval and with much grumbling the ordinary sinner may begin to do what the saint by his example and the prophet by his teaching have shown him. But even if he does not, that is no argument against the saints and prophets; it is merely a condemnation of the ordinary sinner.

The other objection that may be made against the pacifist may seem trivial but is worth discussing. The objector argues it is inconsistent of the pacifist to live in a country which possesses armed forces, to pay taxes for their upkeep and enjoy the protection which they give him. By so doing he is contributing to warlike action and in a passive way at least participating in it. As regards taxes, refusal to pay might be a powerful political weapon if carried out in an organized way by large numbers, specially if they formed a majority in one district; but for pacifists who are few and scattered it would be entirely futile. It would merely result in their goods being sold up, so that the taxes would be paid in the end but with the maximum of waste and inconvenience all round. However this may be, it is perfectly true that you cannot continue to live in an ordered community without to some extent participating in the policy of its government, enjoying the fruits, whatever they may be, of its warlike policy and contributing to its cost. The genuine pacifist, however, who takes an other-worldly or religious view has a simple and effective answer to the objection. He will admit that nobody who lives in a community with an evil policy can escape entirely from defilement by that evil. Where there is only a choice of evils, he chooses the lesser one of acquiescing up to a point in the laws of the country in order to retain as far as possible freedom of speech and action to make his protest when and how it is possible. In any case he will refuse to be a combatant himself even if it costs him his

freedom or life. The pacifist is advocating an ideal and is prepared to suffer for it. He is not concerned with practical politics, but only to bear witness to his faith and prick other men's consciences, even if he does little to alter their actions. As against the kind of pacifist who considers that pacifism is an immediately practicable policy the objection is a serious one. This point will be considered again later.

The case that I have stated for pacifism is based upon general principles of morality, upon the argument that war is unjust. Some pacifists, however, lay more stress upon the evil of violence and of slaughter, and may be inclined even to rest their whole case upon the assumption that "Thou shalt not kill" is an absolute and universally binding rule. This seems to me to be a mistaken policy. Moral codes, such as the prohibitions in the Decalogue, consist of a plurality of rules, as to the kinds of acts to be done or not done. They are very useful guides for most circumstances, but they are not all valid in all circumstances because sometimes they clash and we have to choose which to obey and which to break. The rules themselves give no guidance how the choice is to be made. If any one rule is considered sacrosanct and inviolable, it must be because it is the supreme moral rule and the others subordinate. If "Thou shalt not kill" is the supreme moral rule, it means that the mere preservation of life is good in itself regardless of what people do with their lives. Seeing that everybody has to die some day, this seems absurd. It certainly suggests rather a lop-sided and materialistic view of the aims of human life. It must be admitted, however, that there is something rather special about the prohibition of killing. For practically all wrongs done against a man some compensation can be made afterwards, if he is still alive. But for killing there is no compensation. The rule previously stated seems to me valid, that if an innocent life can be saved only by taking a guilty one, it is right to take it. There are other conceivable circumstances too where killing may be justified. Killing in warfare is of course a different thing, and strictly cannot be justified. The general common-sense view, however, is that the serving soldier is not guilty of any great sin in so far as he runs risks equal to those of the man he kills. The soldier does not in practice appear to be degraded morally by his actions. The contempt and hatred of men has always been reserved for those who cause the slaughter of others while avoiding all risks themselves.

It has to be remembered in this connection that people have their idiosyncrasies as to which they consider the gravest sin. It is hardly a matter of argument but of innate, sometimes almost physical, feeling. There are people who have a special horror of violence and killing which others neither more nor less moral do not feel at all. Those who feel such horror will almost certainly be pacifists. It may cause them to say quite sincerely that they would

rather stand by and see injustice done than use violence towards anyone. One can respect such feelings, but they do not constitute an argument and the pacifist's case would be a weak one if it rested on them alone.

After dealing with what I believe to be genuine pacifism, there are certain kinds of sham pacifism to be considered. The first and most important has been mentioned already, the advocacy of pacifism as a practicable policy in the place of force for resisting external aggression, tyranny, or injustice of any kind. Two forms may be distinguished: one a pure sham, the other more genuine. The first is advocated by those who are comfortable and rich and who reflect that war is extremely uncomfortable and expensive. It seems to them that, if everybody were nice and polite to everybody else and content to leave things just as they are, there need be no wars and nobody need worry. It is true, of course, that "a soft answer turneth away wrath" in a very large number of cases. Perhaps it would in all if everybody was rich and comfortable. Unfortunately, some people are neither but would like to be at somebody else's expense. There are some even who do not care about comfort at all, but want excitement and power and applause. There are some who want even queerer things. At any rate, the world is full of disputes of greater or less violence, about which the participants are not prepared to compromise because they consider that vital interests are involved. Against such advocates of pacifism it is relevant to point out the inconsistency of living in a country with armed forces, paying taxes for their upkeep, and enjoying their protection.

There is, however, a serious argument which must be considered seriously. The argument applies not only to ordinary warfare but to all use of force by one group of people to impose their will on another. To use force against force, it is said, only begets more force and never justice. Justice against aggressors or those who have power can only be obtained by abandoning force and using passive resistance or, in Mr. Gandhi's more accurate terminology, non-violent non-co-operation. Non-co-operation can embarrass aggressors or those in authority and may appeal to their consciences, if they have any. The non-co-operators may suffer but they cause no suffering to others, and their own sufferings constitute part of their propaganda. This argument contains an important germ of truth, but involves certain assumptions which are, to say the least, doubtful. It is assumed (1) that it is possible to organize large numbers of people for non-violent non-co-operation. It is easy enough to organize violent non-co-operation because of the excitement that violent action induces. But the capacity for heroism without excitement is very rare. It is also assumed (2) that those against whom the non-co-operation is directed are not really whole-hearted and confident

in their use of force, so that there is something that can be appealed to. If they are prepared to massacre non-co-operators wholesale, non-co-operation will not worry them. It is hardly conceivable that a Hitler or Stalin would be embarrassed by it. A Mussolini might, because in Italy the voice of Christian tradition has not yet been silenced. The important germ of truth is that within the State, given a certain degree of freedom and at least something of the democratic spirit (a preference for persuasion rather than force), then non-violent non-co-operation provides a last stage of protest short of civil war. If the ordinary methods of public criticism, protest, and organization of opposition in ordinary legal ways all fail to remove grievances, there is still this last method to use. It corresponds in the political sphere to the method of the strike in the industrial. It suffers from the drawback that non-violent non-co-operation pursued on any large scale and with any enthusiasm, if not fairly quickly successful, may easily turn into violent forms, open civil war or secret civil war by methods of terrorism with assassination and bomb throwing. Once resistance to authority is organized, advocates of violence are more likely to be listened to than those of non-violence. Industrial strikes and lock-outs are carried on peacefully only so long as there is a public authority to enforce the keeping of the peace on the parties to the dispute. It is very doubtful whether non-violent non-co-operation would work against an external enemy, unless a very half-hearted one.

The history of mankind does not on the whole favour the notion that the methods of pacifism have any immediate political success. For example, though the abolition of slavery over most of the world has been the result of Christian teaching and example, this has been combined with economic changes which gradually made slavery less profitable, and it has taken nearly two thousand years to do it. As long as there is a demand for slaves the slave trade flourishes, provided it is profitable. What suppressed it in the nineteenth century, by making it unprofitable, was the British Navy. In the long history of slavery the complete helplessness of slaves against their masters has never saved them from exploitation or cruelty. When more primitive people have been in contact with others at a higher stage of development, the more warlike of the primitive people have generally been better treated than the less warlike, for instance the Maoris of New Zealand as compared with the Australian natives. The last and most dreadful instance is the persecution of the Jews (and others) by the Nazis in Germany. The more completely helpless and pacific they have been, the more the rage of their persecutors has been kindled against them. What kind of passive resistance, or non-violent non-co-operation, could they have used that would have saved them from all this deliberate cruelty?

There may arise special conditions at certain times and places which make pacifism a practical policy for limited purposes. But in general it is too much like sprinkling rose-water on a dunghill. It may be that the armed belligerent State is a dunghill, as the pacifist claims. If so, the most he can do is to declare the fact and keep away from it. In the meanwhile it is the duty of the practical politician to cart the dung and spread it where it is needed. The value of the attitude of the pacifist and of voluntarily endured suffering is not political but spiritual. The martyrdom of the early Christians did not influence the policy of the Roman Empire under Nero or even under Marcus Aurelius, but it kept Christianity alive. Genuine pacifism, as I understand it, is necessarily religious, because only religion can supply the motive. That is not to say it is necessarily right; there are false prophets as well as true, spurious saints as well as genuine. It is also necessarily other-worldly in that it appeals to a system of ideals which are not at present realized and may never be realized in this world at all completely, though one always hopes they may be at least partly realized.

Two points of view, which sometimes pass for pacifism, remain to be mentioned briefly. The first is that of the man who refuses to fight in some one particular war because he considers it unjust, though he would be willing to fight in some other he considers just. This is a perfectly reasonable attitude, on the face of it, but as it is not an objection to war as such it is not pacifism. It is an attitude that can hardly be discussed in general terms because there are so many different possible reasons for judging of the relative justice or injustice of wars. It raises, too, the very difficult question of how far a conditional acceptance of civic duties is possible and justifiable. Can a man be half a citizen and half not a citizen or even a rebel? To some extent a man in virtue of his citizenship surrenders his conscience to the keeping of the State, which in practice means the government. On the other hand, the healthy functioning of government requires criticism and, within limits, opposition. These questions cannot be discussed here.

The other point of view has been mentioned in passing. It may be called pacifism of despair. It is argued that owing to the great power of modern governments and modern methods of propaganda, the ordinary person never knows the truth, particularly about foreign affairs, and cannot tell if the policy of his government is right or wrong. Consequently the only sensible course is to listen to nothing and refuse to fight or assist in any kind of warlike action. The argument suffers from the defect that in any case we are involved in the warlike action of our governments, and we all do have opinions, however ill formed, of the rightness or wrongness of our government's policies. But the main weakness of the argument is that

it is entirely negative and implies that politics are, for the ordinary man, meaningless and aimless; so that it should not matter what anyone decides to do. If there is a war it cannot on this view make much difference whether a man dies in uniform or in civilian dress. Indifference cannot be a motive for genuine pacifism, some positive motive is needed.

To sum up. The case for being prepared to fight depends on political expediency; the safety of the State demands it, and the safety of the State means the safety of our friends and families. The pacifist's case against war is that political expediency should be subordinate to the moral ideal, and our friend's claim should not blind us to the claims of all humanity. The issue is between the good of our country which ultimately may not be good at all, and a good not yet attainable and perhaps never to be realized on this earth. It is one aspect of the conflict between standards that are actually operative and seen in the rule of law, and ideals that are not operative but compared with which the law is hardly of value at all.

HEGEL'S DIALECTIC IN HISTORICAL PHILOSOPHY[1]

J. O. WISDOM, PH.D.

Conflicting Systems in the History of Philosophy.

Hegel's logic consists, as is well known, in a chain of categories, connected by a relation of dialectic, which proceeded from the featureless Being, Nothing, and Becoming through more important ones such as Substance, Cause, and Reciprocity to the highest category of all, the Absolute Idea. Now Hegel also pointed to an interesting correlation between the categories of his logic and the dominant concepts of those philosophies that preceded his own: that is to say, the *logical* order of categories given by him corresponded to the *temporal* order of the history of philosophy. Such connexion was not, however, to be regarded as an accident but as a necessary truth: for the Absolute manifested itself temporally in the form of the history of philosophy. Seeing that this contention probably contains some psychological truth and is probably assumed in Marxian interpretations of Hegel, it may be of some interest to see how far it can be substantiated.

On first approaching the history of philosophy, one might find no signs of an orderly development, such as is for most part to be found in the history of science; and the notorious lack of contribution to our knowledge made by philosophy makes it unlikely that closer examination will reveal such a development. There is, however, clearly some order, even if it is nothing more than the order brought about by historical, sociological, and psychological circumstances: that is to say, a system of philosophy in the series of historical systems is generated, partly at any rate, by the stimulus of and by opposition to its predecessors. Now the question arises whether the order is generated in this manner alone or whether it contains a logical structure as well as temporal and casual connexions: is the temporal, historical order in any way connected with a truth-order? According to Hegel the series was connected by an objective logical relation. In support of his view he draws attention to the common supposition that it consists of a mass of *conflicting* systems invented by men that had nothing better to do and that wanted to undo and

[1] I wish to thank Professor Broad, who has been so good as to read this paper and make a number of suggestions that have enabled me to improve the clarity of certain points and to be more accurate about certain facts.

to outdo previous systems by a new one even more phantastic than its predecessors; and the concession might even be made that no doubt there was *some* truth in it all. Were this the case, says Hegel,[1] "the history of philosophy would be of all studies most saddening, when it displayed to us the refutation of every system which time has brought forth." What will naturally occur to us is that whether the history of philosophy is saddening or not is beside the point. If it so happened that all known philosophy were false, that would have to be faced, and personal disappointment would be irrelevant. But probably most of those that take an interest in philosophy believe that truth is discoverable—without some such assumption philosophic study becomes futile. If it is held that in fact all the philosophy of the past 2,500 years is false, what reasonable hope have we of discovering the truth now—what probability is there that for the first time in history a true philosophic discovery should be made? The chances would be very small. On these grounds it is reasonable, from the Hegelian standpoint, to hold that philosophers at different times discovered truths, and that their systems did not consist merely of a mass of conflicting views, all false. It would be difficult to state in brief compass the ways in which they might have been consistent, but a completely universal conflict of opinion may be rejected, which is a point that must be taken into account in any statement of the nature of the history of philosophy. Thus Hegel may be said to have assumed that there was an order of discovery and development of philosophy on the grounds that philosophic truth existed as a fact and that its existence was inconceivable without some form of development.

On account of the correlation between historical philosophy and logic, the problem here described was to Hegel the same as that of answering the question: "What is philosophy?" Anyone that was present at the Philosophic Congress at Reading in July 1932,[2] might deem it foolhardy to venture an answer, for there was a symposium on that very subject in which no two speakers' views of philosophy seemed at all closely connected. But, assuming that philosophy has a more or less dominant meaning at any one period, we may deal with historical systems by saying that philosophy had different meanings at different periods. Even so, however, what have the various kinds in common with one another to bring them all under the same heading? In view of this difficulty, we might infer that we have not yet discovered the true nature of philosophy, but that we are progressing steadily nearer to it, and that each successive philosophy is equivalent to a category that is nearer than its pre-

[1] Hegel: *Logic*, trans. by Wallace, Oxford, 1874, § 86, Lect. Note.

[2] Joint Session of the Aristotelian Society and the Mind Association, Sup. vol. xi, London, 1932.

decessor to the goal giving the true definition of philosophy. At this point, however, a distinction must be drawn. The goal of philosophy—up to Hegel—was, presumably, to discover the ultimate truth about the universe; but if so the revelance of attaining the ultimate definition of philosophy might be called in question, for it might well be possible to discover the true nature of philosophy without knowing anything ultimate about the universe. For Hegel, however, this question could not arise, since the discovery of a new category not only added to the fullness of our comprehension of philosophy but *ipso facto* increased our knowledge about the universe. Hence, if we are engaged with a problem of truth-order about the universe, we are equally concerned with the truth-order of philosophical systems.

Historical Philosophy as an Ordered Growth.

But if the truths of a number of philosophical systems are to be arranged in an ordered series, by what principle is the order to be decided? Evidently three propositions are required: (*a*) Every philosopher of the past revealed some truth; (*b*) the time-order of these philosophers' views corresponds to advances in the discovery of truth; and (*c*) no gaps occurred in the series of truth discovered—that is to say, if truth is an ordered series of truths, it would be impossible to discover a truth unless its predecessors were already known. It would be easy to satisfy (*a*) by enacting that no one that failed to reveal some truth could be counted a philosopher, and (*b*) by enacting that the rediscovery of a truth would not rank as a contribution to philosophical knowledge, so that a new truth must be a discovery; (*c*) might be accepted as being reasonably plausible. Our three propositions could be regarded as defining a growing body of truth, and they may fairly be regarded as crystallizing Hegel's approach. It is not, however, here implied that these propositions form the only basis for a growing body of truth; the most that can be claimed is that as a definition of the Hegelian view they endow it with more plausibility than most ways of presenting it.

For purposes of discussing a philosophical contribution as a whole, we may fairly regard it as being summarized under a *dominant concept,* which is to epitomize the truth of the contribution. The history of philosophy will then consist of an ordered series of dominant concepts, each adding its quota to the general body of truth. Two views might be taken of the relation between two successive dominant concepts: the later might be merely superadded to the earlier, making a total of one truth *plus* another truth, or it might bear to it a special relation of absorbing it in some unique way. The latter was in fact Hegel's view, which he held on the grounds that new truth emerged on account of the recognition of falsity in some degree in old truth. It will be recalled that he regarded anything

short of Absolute Truth as being partially false in the sense of being one-sided. Accordingly a new truth must contain all previously discovered truth as aspects of itself; and in this way the series of dominant concepts proceeds from truth that is partially false, to truth that merges their truth and sheds their falsity. This is the sense in which Hegel regarded philosophy or the history of philosophy as a growing body of truth. Clearly the relation connecting two successive dominant concepts was of a highly characteristic nature; it was in fact what Hegel called the relation of *dialectic*. Thus we see how the historical development of philosophy was governed by a dialectic of its dominant concepts, in the same sort of way as logical dialectic governed the categories of Hegel's own Logic.

It may be observed that at any given time a philosopher would not in general have a complete comprehension of the truth he was contributing, for to do so would be to recognize its aspect of falsity and so transcend his own discovery to the next one: "no philosophy oversteps its own time."[1] Hegel himself, however, was in this position, since he believed himself to be the discoverer of Absolute Truth, of being able to grasp the entire nature both of his own contribution and that of everybody else, for there would be no question of his transcending his own discovery if it were final and absolute. It follows also that he must have conceived the history of philosophy as a history of Hegelianism: thus he claimed for his system that it left out no vital idea that had ever occurred in the subject. That he believed he had subsumed under his own principle of dialectic all the dominant concepts of his predecessors is evident from the following:[2] "The demand that a history, whatever the subject may be, should state the facts without prejudice and without any particular object or end to be gained by its means, must be regarded as a fair one. But with a commonplace demand like this we do not get far; for the history of a subject is necessarily intimately connected with the conception formed of it. In accordance with this, what is important in it is determined, and the relation of the events to the end regulates the selection of the facts to be recorded, the mode of comprehending them, and the point of view under which they are regarded." Clearly Hegel believed that his own principle—for he did not entertain the possibility of there being an alternative—of merging constituents into an organic unity was the one in accordance with which the facts were to be selected and comprehended. He substantiated his contention that his system retained all previous conceptions of value by pointing to the way philosophic material might be collected and systemized:[3] " . . . how should we begin to treat a subject, the name of which is certainly mentioned enough,

[1] Hegel: *Lectures on the History of Philosophy*, vol. iii, London, 1896, p. 547.
[2] *Ibid.*, vol. i, 1892, p. xv. [3] *Ibid.*, p. xvii.

but of whose nature we as yet know nothing? In treating the history of philosophy thus, we could have no other guidance than that of seeking out and taking up whatever has received the name of 'philosophy' anywhere or at any time. But in fact, when the absolute nature[1] of 'philosophy' is established, not arbitrarily, but in a scientific way, such treatment becomes the science of philosophy itself." On the other hand, Hegel held no brief for reading modern ideas and inferences into the sayings of the ancients:[2] "We ought not by such deductions to make an ancient philosophy into something quite different from what it originally was." Whether he was true to this precept is, however, another matter.

"Refutation" as Philosophic Metabolism.

Hegel himself made no systematic attempt to build up his interpretation of the history of philosophy on lines such as the foregoing. His attitude was that anyone that grasped and agreed with his dialectic would also agree with his interpretation of the thought of his predecessors, and so he seldom devoted to the subject more than a few paragraphs, which were really nothing more than bare statements of his view, plausible to those that had grasped the secret of dialectic. The germ of an argument is, however, given in his remarks on "refutation" and "conflict of philosophical systems." Hegel denied that one philosophy "refuted" another, in the ordinary sense of that word, though he gave little specific reason for the denial, beyond saying that "the history of philosophy would be of all studies most saddening, when it displayed to us the refutation of every system which time has brought forth." Another reason would be that he regarded philosophy as "organic," and not unnaturally the history of philosophy as equally "organic," for in no sense could a mere collection of mutually refuting systems be said to be organic. His remarks, therefore, are devoted almost entirely to his own concept of refutation, with which he could say that one philosophy did truly refute another. For Hegel there was but "one philosophy at different stages of completion";[3] and of this philosophy it must be held that " . . . it is one Idea in its totality and in all its individual parts, like one life in a living being, one pulse throbs throughout all its members";[4] " . . . every philosophy has been and still is necessary. Thus none have passed away, but all are affirmatively contained as elements in a whole. But we must distinguish between the particular principle of these philosophies as particular, and the realization of this principle throughout the whole compass of the world. The

[1] I have substituted "absolute nature" here for the translation of *Begriff.*
[2] Hegel: *Op. cit.*, p. 44.
[3] Hegel: *Logic*, translated by Wallace, Oxford, 1874, § 13.
[4] Hegel: *Lectures on the History of Philosophy*, vol. i, 1892, p. 28.

principles are retained, the most recent philosophy being the result of all preceding, and hence no philosophy has ever been refuted. *What has been refuted is not the principle of this philosophy, but merely the fact that this principle should be considered final and absolute.*"[1] One philosophy refutes another in the same sort of way in which the fruit may be said to refute the blossom.[2] Philosophy is a *development*, a growth, and progresses by *philosophic metabolism*, in which a later stage of development *replaces* an earlier—in the sense in which the fruit *replaces* the blossom, but not that in which a new cook replaces an old one, nor that in which one wife of Henry VIII replaced another, but in the sense in which the being that Henry was at one time replaced the being he was previous to that time.

Hegel's view of refutation is not so unplausible as it may at first seem, but he nowhere attempts to demonstrate its *a priori* necessity. His best statement of the whole doctrine is the following.[3] "In the history of philosophy the different stages of the logical Idea assume the shape of successive systems, each of which is based on a particular definition of the Absolute. As the logical Idea is seen to unfold itself in a process from the abstract to the concrete, so in the history of philosophy the earliest systems are the most abstract, and thus at the same time have least in them. The relation, too, of the earlier to the later systems of philosophy is much like the relation of the earlier to the later stages of the logical Idea: in other words, the former are preserved in the latter, but in a subordinate and functional position. This is the true meaning of a much misunderstood phenomenon in the history of philosophy—the refutation of one system by another, of an earlier by a later. Most commonly the refutation is understood in a purely negative sense, and interpreted to mean that the system refuted no longer holds its ground, but is set aside and rendered for ever obsolete. Were it so, the history of philosophy would be of all studies most saddening, when it displayed to us the refutation of every system which time has brought forth. Now, although it may be upon the whole admitted that every philosophy has been refuted, it must be in an equal degree maintained, that no philosophy has been refuted, nay, or can be refuted. And that in two ways. For firstly, every philosophy that deserves the name, always has the Idea for its subject-matter or contents: and secondly every system should represent to us one particular factor of particular stage in the evolution of the Idea. The refutation of a philosophy, therefore, only means that its limits are passed, and that the fixed principle in it has been reduced to an organic element in the com-

[1] Hegel: *Lectures on the History of Philosophy*, vol. i, London, 1892, p. 37—my italics.

[2] Hegel: *The Phenomenology of Mind*, London, 1931, p. 68.

[3] Hegel: *Logic, supra cit.*, § 86, Lect. Note.

pleter principle that follows." In a word, the history of philosophy is the Absolute Idea expressed in terms of time, its stages being embodied in temporal philosophies.

Internal and External Dialectic.

Now there is a very important difference between the dialectic that connects the categories of Hegel's logic and the dialectic that connected the dominant concepts of historical philosophy. The latter is what Hegel would call "external," while the former is "internal." Thus the passage from one category to another is an internal passage, for no external consideration is required to effect the transition. Each category may, therefore, be said to be "in" every other (implicitly or explicitly): Being, for example, is *in* Essence (explicitly) and Essence is *in* Being (implicitly)—each is *in* the other. The relation of dialectic is also internal; it is not something imposed from without—by the philosopher—but is self-imposed by the categories from within, so that without the dialectic the categories would not be what they are. Now this self-imposition of the dialectic is very important, for it distinguishes the triadic movement of Hegel from the "frozen" triads of Fichte. Conversely, by comparing Fichte's logic with Hegel's, we may be able to clarify the distinction between internal and external dialectic.

In the case of Fichte some concept or other was first of all posited as thesis; then it was necessary for the *philosopher* to *posit* the antithesis, for without this the thesis could have no real meaning; and finally the *philosopher* had to *posit* the synthesis to harmonize the other two. This, indeed, if dialectic at all, is *external* dialectic; but real dialectic does not wait for the *philosopher*—Fichte—to initiate some *positing*. Hegel's concepts do their own positing and weave their own dialectic. The first stage, the immediate, corresponding to Fichte's thesis, by its own falsity or one-sidedness passes to the next stage or *negates itself*. Hegel calls this second stage the "first negation," and it is achieved by an internal repulsion of the immediate from itself: that is to say, the *philosopher* is not called upon to help it to negate itself. Again, the first negation by an *inward* dialectical movement propels itself to a third stage. The dialectic is older now, but still disdains the aid of the philosopher, the follower of Fichte; instead it derives support from its previous form, and, combining with its first stage by a step that corresponds to Fichte's synthesis, it becomes the *second negation*. Let us try to crystallize the point.

Two things are required by Fichte for his dialectic: a philosopher to posit terms, and terms to posit. The ensuing connexion between the terms once posited is of a semi-internal and semi-external character; for so far as the thesis has no meaning without the anti-

thesis, the relation is internal; but so far as the antithesis is in no way deducible from the thesis by consideration of the thesis alone, the relation is external. The connexion may perhaps be exemplified by the loosely jointed relation between *shape* and *size*, in that we cannot have an instance of shape without having an instance of size —if we assume for purposes of the illustration that *having an instance* in the physical world is analogous to *having meaning* in the conceptual sphere—yet to deduce one from the other is impossible (at any rate according to Fichte). Thus the argument for the existence *size* on data *shape* is of the form: "*Shape* is impossible in the absence of *size*; therefore *size* must be posited." This, we may observe, is a "transcendental" form of reasoning, such as Kant used in positing *a priori* synthethic propositions without which the world of experience would be impossible. Thus "With Fichte, the 'Ego' is the starting-point in the philosophical development: and the outcome of its action is supposed to be visible in the categories. But in Fichte the 'Ego' is not really presented as a free, spontaneous energy; it is supposed to receive its first excitation by an impulse from without. Against this impulse the 'Ego' will, it is assumed, react, and only through this reaction does it first become conscious of itself. Meanwhile, the nature of the impulse remains a stranger beyond our pale: and the 'Ego,' with something else always confronting it, is weighted with a condition. Fichte, in consequence, never advanced beyond Kant's conclusion, that the finite only is knowable, while the infinite transcends the range of thought. What Kant calls the thing-in-itself, Fichte calls the impulse from without—that abstraction of another 'Ego,' not otherwise describable or definable than as the negative or non-Ego in general."[1] Now Hegel—to revert to our illustration—would, on the contrary, deny the impossibility of deducing *size* from *shape*: he would say that Fichte would have asserted this impossibility through beginning with a false abstraction, in which *shape* did not contain *size* within itself; whereas he himself would hold that, with sufficiently deep examination, *shape* would be found to involve (dialectically) *size*. Hence for Hegel the thesis and antithesis, however deeply connected they may be, are externally connected so long as they lie outside one another: for him the thesis must contain the antithesis; otherwise it would be impossible to deduce the antithesis from the thesis. This contention may be illustrated by the relation between premisses and conclusion of a chain of reasoning in which these are not external to one another, but in a sense the conclusion is contained in the premisses. The point about the necessity or otherwise for having a philosopher to posit terms is this: a conclusion is contained in its premisses whether anyone deduces it or not; but a thinker is needed if *shape* is to be related to *size*.

[1] Hegel: *Logic, supra cit.*, § 60.

Lastly the dialectic relation is for Hegel one of *movement*: it is dynamic, whereas Fichte's is static, and the antithesis *evolves* by its own *movement* from the thesis. Now clearly the categories do not literally move, so we must ask what Hegel means by such a metaphor. Movement undoubtedly takes place in the mind of the philosopher tracing the dialectic, but this is not the signification intended. What Hegel meant was in a certain respect akin to the way in which an unmediated inference from a premiss is "forced upon" the mind: that is to say, the mind has no need to perform an act of mediation or seek an additional premiss in combination with which the given one will yield the inference. In the same way the thesis, for Hegel, does not require an act of synthesis or combination to be performed by the philosopher, but, when he reflects upon it, forces the antithesis upon him. It is, indeed, true that the dialectic does not evolve by immediate or unmediated deduction, and so does not resemble immediate inference in this respect; but, so far as the dialectic progresses by mediation, it produces its own mediation—we might say that the *process of mediation* is like an immediate inference. Thus we see that there is an important difference between internal and external dialectic, and that the latter is to be associated with Fichte. In view of this it is somewhat astonishing how many writers on Hegel have persisted in the use of Fichte's terms—even McTaggart who was one of the few of recent years to treat Hegel faithfully stuck to their use. It is no mere trifling matter, because for Hegel Fichte's words carry as a millstone round their philosophic necks the *externality* of the connecting "dialectic" and give quite a false colouring to Hegel's Logic.

If we consider how Hegel's form of internal dialectic applies to the history of philosophy, we see at once that a *system* did *not* repel itself from itself and pass into its opposite, but that a *philosopher* feeling discontent for psychological and historical reasons gave birth to a new system which was the opposite of the old one. Historically it was in this way that opposites were posited, and similarly with the merging of opposites into an organic unity in the third stage. Whatever dialectic operated here was evidently *external*—and external in exactly the same way as Fichte's. Here, therefore, Fichte's terms might be used if desired: "thesis," "antithesis," and "synthesis" seem adequate to describe the history of philosophy, but not the logic of philosophy—or the philosophy of logic, as it would equally well be for Hegel. Just as Fichte or some philosopher was required to *posit* an opposite and to make of himself a free gift of "dialectic," so is the critical and speculative historian in duty bound to add the dialectic of historical philosophy: that is to say, a book that gives philosophies in their time-order chapter by chapter is no work of the history of philosophy—the historian must interspace

each of these chapters with a critical review of the dialectic that leads from one system to the next.

Hegel did not account for the Rational Necessity of Post-Hegelian Philosophy.

It will be convenient now to summarize the foregoing so as to lead up to a criticism of Hegel along lines that are, I believe, new.

Each category contains all categories lower than itself (explicitly) and contains their truth as well as a truth of its own—the higher the category, the greater the truth. Moreover, each philosophy corresponds in time-order to the truth-order of the categories, and in this way a higher category and a later philosophy contain within themselves respectively more truth than a lower category and an earlier philosophy: "In philosophy the latest birth of time is the result of all the systems that have preceded it, and must include their principles; and so, if, on other grounds, it deserves the title of philosophy, it will be the fullest, most comprehensive, and most adequate system of all."[1] Now how, it may be asked, is it that Hegel's system could fulfil his claim and at the same time be superior to those that follow, since they (if he would have admitted that there could be such a thing as post-Hegelian philosophy) must contain his and more besides? On his own showing Hegel seems to have doomed his philosophy, and it is extraordinary that the possibility should never apparently have occurred to him that fresh philosophic views might come into being. He must have believed that no new idea was possible—but he was probably not the only philosopher to have thought so. The point here raised will require considerable amplification, and any criticism of Hegel, to be effective, must be advanced *along his own lines.*

The position is this: according to Hegel, the latest philosophy in time is the truest, and he himself had said the final word in philosophy, but these two propositions together entail that there could be no future philosophy. No doubt others have believed their systems to be final; but in such instances there is nothing incompatible with the very existence of subsequent philosophy—all that such thinkers would say is that subsequent philosophy was false, but not that its existence was logically impossible.

It seems to me that this difficulty is a very genuine one for Hegel, and that consideration of it must lead to a new way of looking at his philosophy. The suggestion that I will put forward will render it no longer necessary to accept or reject Hegel's system *in toto*: in other words, that unique character among philosophies of being quite simply affirmed or refused can no longer belong to Hegel's. My suggestion is, I think, Hegelian in essence, and it is perhaps surprising

[1] Hegel: *Logic, supra cit.*, § 13.

that he did not think of it himself. Evidently the difficulty of his position never occurred to him; he must simply have believed that there would be literally *no future philosophic speculation*, which seems obviously false. Hegel might, however, have defended himself in either of two ways. He might have reminded us that the bulk of modern philosophy was critical and logical, and so non-speculative; but he would also have to maintain that the systems of Bergson, the British Absolutists, the Italian Idealists, Whitehead, and others, contained no new speculative idea that was not already included in some category of his own Encyclopedia. To investigate this in detail lies outside the scope of the present paper, but a general remark may be made that these post-Hegelian philosophies bear the character of philosophies of nature or perhaps spirit rather than that of transcendental logic—a point of importance in relation to the present theme and one to which we shall return.[1] Again, Hegel might plausibly have held that he had attained the goal of philosophy, achieved the highest category, and so said the final word. He said the final word, however, only in the sense of discovering the highest and most ultimate category, but not in the sense that each category was itself settled for life; for each is capable of development into sub-categories —Hegel himself developed some categories at great length into groups of sub-categories, while others he left alone. There would therefore seem to be no reason why philosophy, though in a sense it ended with Hegel, should not continue patiently developing the content of each category separately: thus if all the categories from Being to Philosophy (which is the final category of the Philosophy of Spirit)[2] are written down the page in triads, they form or express in a rough manner the *completedness* of philosophy, and their *development* of *expansion* might be expressed by writing down triads of sub-categories from left to right across the page. This development would then indicate the trend of modern philosophy, the vertical movement being complete. In other words, Hegel would really have told the whole story of philosophy—he would have been the director and his successors his clerks filling in details. There is but one philosophy at different stages of completion and Hegel would have been its author; it contained all philosophies previous to it and it contains all subsequent to it, even though he did not write it all himself—must there not be clerks to do the writing? In some such way Hegel might have described the nature of post-Hegelian philosophy. The view

[1] *Infra*, p. 261.

[2] *I.e.* according to the *Philosophy of Spirit*, but in the *Philosophy of Religion*, McTaggart points out, the final category is that of community of persons mutually animated by the deepest feelings of esteem: see J. McT. E. McTaggart: *A Commentary on Hegel's Logic*, Cambridge, 1910, § 295. The difference between them, if there is one, does not, however, affect the present discussion.

from the Hegelian standpoint is plausible because it leaves room for both Hegel and his successors in the absolute scheme of truth, even if post-Hegelians felt themselves to be merely filling places of minor importance. What is, however, a potent objection on Hegelian grounds is that no rational necessity for such a procedure is at all evident. Nor does it account for the significant fact —the significance will appear later—that Hegel's *Naturphilosophie* and *Philosophy of Spirit* are vastly inferior to the *Logic*. These two lines of defence not being tenable, it is clear that Hegel's system cannot stand *in toto* as was once thought; but on the other hand it may not follow that the entire system falls *in toto*. Contrary to what has often been asserted, it may not be necessary to regard it as wholly true or wholly false with no *via media*, in spite of the fact that the organic unity of the system does not appear to brook our accepting one part and rejecting another. Instead of inferring that Hegel's view of historical philosophy is undermined and that the principle of dialectic is completely false, we must, if we are to criticize Hegel from his own standpoint, aim at a minimum overhaul of his system. The true solution of the difficulty that lies in Hegel's implied denial of subsequent speculation must in the Hegelian manner account for the *rational* necessity of the existence of post-Hegelian philosophy. The suggestion here offered of this does not claim to be a proof or rational demonstration; it consists rather in pointing to certain facts that would probably be otherwise if the suggestion were not true.

Hegel's Logic and the Corresponding Historical Periods.

Let us consider with closer reference to Hegel the correlation between his philosophy and the history of philosophy. His system divided into three stages: Logic (culminating in the Concrete Mergence of Identity and Difference (*i.e.*, the category of *der Begriff* in general), or more explicitly as the Absolute Idea), Nature (proceeding from the category of Space to the sphere of Organics), and Spirit or Mind (*der Geist*) (developing from Subjective Spirit, as in man, through Objective Spirit, as in the State, to Absolute Spirit, whose explicitness was the category of Philosophy). Thus Hegel's highest category was that of Absolute Spirit, which in its most developed form he called "Philosophy."[1] Accordingly the history of philosophy must have passed through a period corresponding to the Logic, then through a period corresponding to Nature, and finally through a period corresponding to Spirit, the process being completed by Hegel himself in his doctrine of Absolute Spirit. Now the spheres of Logic, Nature, and Spirit differ very greatly in content and the philosophies corresponding to these spheres must also differ very greatly in content: that is to say, there must have been a very

[1] See, however, footnote *supra*, p. 253.

marked difference between the period of philosophy during which the categories of the Logic were discovered and the other two periods during which the categories of Nature and Spirit were brought to light. It so happens, however, that there *were* three periods of a markedly different nature in the history of philosophy, namely, those of Greek, Scholastic, and Modern (*i.e.* Cartesian to Hegelian) Philosophy—not to mention Oriental philosophy, of which little was known in Europe in Hegel's time; but did Hegel hold that the period from Parmenides to Aristotle formed the history of the categories of the Logic, the Scholastic age producing the Philosophy of Nature, and Cartesian to Hegelian period the categories of Spirit? Such is not as a matter of fact the case; but Hegel did not suggest anything of the sort. For one thing, the category that Hegel assigned as corresponding to Aristotle's philosophy was Matter and Form, which is by no means the top category of the Logic—it is in fact quite a low one. Again Hegel scarcely regarded the subtleties of the Schoolmen as philosophy at all. But the most potent point is that the categories of the sphere of Concrete Mergence of Identity and Difference (*der Begriff*) are what Hegel claimed as his own special contribution to philosophy. Concrete Mergence—as we may call it for short—is the highest sphere of the Logic and was peculiarly Hegel's own: no idea of the merging of opposites with his fullness of meaning had previously occurred. *Hence it follows that the Logic could in no sense be said to have been completed, even in raw material, quite apart from its being integrated by dialectic, before Hegel's time.*

Hegel Overstepped his own Time.

What then becomes of the status of the Philosophies of Nature and of Spirit? Hegel is apparently to be credited with contributing to the history of philosophy not only a small but important part of the Logic, the sphere of Concrete Mergence, but also the philosophies of Nature and Spirit as well, although for these he had derived none of the material elsewhere. It seems a gigantic achievement that he should have done all this; and suspicious that he should have so outstripped his own time—it is indeed interesting to note that, owing to a certain relation that Hegel believed to hold between philosophy and history, he inferred that "no philosophy oversteps its own time."[1] It seems plain that he tried to do the impossible: for if it is admitted that his contribution was the final sphere of the Logic, he was overstepping his time in trying to give adequate philosophies of nature and of spirit. It is natural to infer, therefore, that however good his *Logic* may be, no weight can be attached to his *Naturphilosophie* and *Philosophy of Spirit*, a point that is borne out by the significant fact already mentioned that

[1] Quoted above, p. 246.

these works are vastly inferior to the *Logic*.[1] This last remark, could, however, be equally well put in another form: that the inferiority of these two works would be accounted for by Hegel's overstepping his time.

But it might reasonably seem that Hegel could be defended from this charge on the grounds that once the principle of dialectic was discovered, nothing more remained to be done except to work out its consequences. Thus the Philosophy of Nature could have been deduced in a more or less mechanical way; and indeed there is some reason for supposing that Hegel did compose his work on Nature in some such manner, for the categories of Nature are but those of the Logic in spatial form. There is a strong reason, however, why the dialectic could not be applied to new forms of material as if it were a sausage-machine, and that is that the dialectic itself undergoes *dialectical change*. Hegel himself never gave much thought to this aspect of the dialectic; he probably took it for granted that it was a relation of exactly the same sort everywhere it occurred, *e.g.* that the dialectic between the categories of Being and Nothing was the same as that between Quality and Limit. That this was not the case, however, was clearly seen by McTaggart[2], who showed not only that the dialectic was not always the same, but that it varied continuously from point to point. It is not surprising, therefore, that the dialectic at the end of the Logic has an almost entirely different character from what it has at the beginning. Further, the transition by which Hegel tried to pass, by dialectic, from the Absolute Idea to Nature is of a wholly different character from the transitions in any part of the Logic; and not only *is* the character different (for this alone would not mean a great deal, since this particular transition is considered very much open to question), but, as Macran has explained,[3] it *necessarily must* be different. Though it does not follow that the nature of the dialectic in the Philosophy of Nature must be of a wholly new kind, the possibility of such a change should not be ignored, and Hegel had no right to proceed as if no such change existed. That the quality of Hegel's deductions in his *Naturphilosophie* is much inferior to that of his deductions in his *Logic* is evidence (though not, of course, conclusive evidence) that the dialectic was really altered in the new sphere. The contention might, however, be brought forward that the categories of the Philosophy of Nature

[1] See *supra*, p. 254. This is a personal impression and may be dogmatic. Cf., however, W. T. Stace: *The Philosophy of Hegel*, London, 1924, § 435, wherein Professor Stace refers to the Philosophy of Nature as of merely historical interest.

[2] J. McT. E. McTaggart: *Studies in the Hegelian Dialectic*, Cambridge, 1922, chap. iv.

[3] H. S. Macran: *Hegel's Doctrine of Formal Logic*, Oxford, 1912, Introduction, pp. 79–85.

would naturally be the categories of the Logic over again, but, to use a Hegelian turn of expression, *in the form of "externality"*: thus Being, which is the first category of the Logic, when taken in the form of *externality* becomes Space, which is the first category of the Philosophy of Nature; for Being implies that the least that can be said of anything is barely that it *is*, and Being in the form of externality implies that the least that can be said of anything is that it *is in an external way, i.e. is spatial.* Now it is, indeed, likely that Hegel resorted to some such device as this for finding the constituent matter for his philosophies of Nature and Spirit—that is, he used a mechanism instead of dialectical reasoning. If this is so, it would not be surprising that his attempts to join up these constituents dialectically were not so successful as they were in his Logic, *if the dialectic no longer remained the same.* Hence there is some likelihood that the dialectic became altered in character. Now this can be substantiated independently. For the dialectic is not to be regarded as a relation external to the terms of categories that it relates: its nature is defined by the kind of categories it works on (while it in its turn defined them). Thus the dialectic of the sphere of Being is that of abstract opposition, while of the sphere of Essence it is that of correlative opposition, and in the sphere of Concrete Mergence, it is that of mutually absorbing opposition, and hence the nature of the dialectic depends on what kind of categories it weaves and is spun by. This being so, we should expect that the category of Space would be a very different effect from that of Being upon the dialectic that evolves. All that can be said about the value of the *Naturphilosophie* on Hegelian grounds is, then, that it was a brilliant attempt to forecast the unforeseeable—at best this work could only be regarded as an approximate forecast. The general conclusion would follow that Hegel's philosophy must be assessed by the value of his Logic and by nothing else; his addition to the body of philosophy was the sphere of Concrete Mergence, but his Philosophies of Nature and Spirit were not contributions.

A second defence against the charge of overstepping his time could be brought forward in the form: "How can it be accounted for that the *Philosophy of Spirit* is a much better work than the *Naturphilosophie*?" In this case the categories of the Logic have to be expressed not in the form of externality but in the form of spirit; and possibly this is easier to carry out, since categories of spirit have meanings more closely connected with the deeper aspects of the human mind than have categories of the physical. Again, the third category of any triad, according to Hegel, was "nearer to" the first than was the second, since the third was a *return* to the first, *i.e.* was the first made concrete. To examine this point more precisely would require an excursion into the whole principle of dialectic; but

enough has probably been said to indicate what is meant. The application to the present point is that Spirit is the third category of the triad of Logic, Nature, and Spirit, and is accordingly "nearer to" the Logic than is Nature, and so better results might occur by expressing the categories of the Logic in terms of spirit than in terms of nature. It should be added that what is here suggested is merely that it is compatible with Hegel's principles that the *Philosophy of Spirit* should be a better work than the *Naturphilosophie*—obviously there may be any number of reasons for this, such as Hegel's own interest in his works, his health when writing them, and so on.

Now Hegel might be given a much more radical defence by means of a certain interpretation of the scope or denotation of the word "category": for it might be maintained that only the Logic dealt with categories, while the Philosophies of Nature and Spirit dealt with "non-categorial universals,"[1] whence it could be reasonably held that Hegel meant his correlation between historical philosophy and his own to involve logical categories only and not non-categorial universals. This is a somewhat curious point, which appears to be merely verbal, but which might well have important consequences for the critique of Hegel. We shall, therefore, have to ask ourselves what is a category. According to Professor Stace, categories are "a special kind of universals whose peculiarity is that they apply to everything, are universal in their scope. The philosophy of nature deals with other universals, universals which are not categories, universals which apply only to some things and not to all. Everything in the universe has being, has qualities, is a cause, or an effect. Being, Quality, Cause, Effect, are therefore categories, and fall within the sphere of Logic. But only *some* things are plants, only *some* are animals, only some are inorganic matter. 'Plant,' 'animal,' 'inorganic matter,' are therefore universals of a kind wholly different from categories, and they therefore fall outside the sphere of the Logic."[2] "The distinction between the categories and the universals of nature may also be expressed by saying that the categories are pure non-sensuous universals while the universals of nature are sensuous universals."[3] Wallace would agree with this:[4] "The Logic of Hegel is the Science of Thought as a natural system of its characteristic forms, which in their entirety constitute the Idea. These forms or types of thought, the moulds in which the Idea confines itself in its evolution, are not unlike what have otherwise been called the Categories." But then Wallace adds a sentence in brackets that may place the point in an entirely different perspective:[4] "(Of course the foreign word 'Categories' does not commend itself to Hegel.)" We may now ask on what basis it could be claimed that Hegel regarded the concepts of

[1] Stace: *Op. cit.*, §§ 416–17. [2] *Ibid.*, § 416.
[3] *Ibid.*, § 417. [4] Hegel: *Op. cit.*, Prolegomena by Wallace, p. cxvi.

his Logic as categories and as different in kind from those of his Philosophy of Nature. We realize that Hegel himself scarcely used the term "category," but it would be well to examine what little he did say in this connexion. Thus "The categories may be viewed in two aspects. On the one hand it is by their instrumentality that the mere perception of sense rises to objectivity and experience. On the other hand, these notions are unities in our consciousness merely: they are subsequently conditioned by the material given to them, and having nothing in themselves they can be applied to use only within the range of experience."[1] From this their function would seem to be exactly like that of the Kantian categories: to unify experience, but in abstraction from the manifold of sense to be entirely void. This view of the passage is confirmed by the following:[2] ". . . the categories are unfit to express the characters of the Absolute —the Absolute not being given in perception;—and Understanding, or knowledge by means of the categories, is consequently incapable of knowing the Things-in-themselves." The identification of the categories with the Understanding shows that Hegel restricted the term "categories" to the sphere of Essence, the second of the three parts of the Logic, and did not admit its use in the sphere of Reason or Concrete Mergence, the third part of the Logic; and this restriction would *ipso facto* render the categories unfit to express the Absolute. Here again we find him using the term in the Kantian way—as if "category" was the term suitable to describe philosophy up to his own but not adequate for the dialectical contribution. Hegel's own remarks, then, do not appear to support Professor Stace or Wallace, at any rate so far as terminology is concerned; we must therefore see if they have interpreted Hegel correctly in a terminology that differs from Hegel's own.

Professor Stace maintains, as we saw, that non-categorial universals differ from logical categories in being "sensuous" universals, *i.e.* they apply only to particular classes of objects in nature, whereas logical categories apply to all things. There is, however, a certain difficulty in this view, in that the categories of Being and Essence, for example, do not apply to organic life, art, or the Absolute, and, moreover, the categories of Concrete Mergence, for example, do not apply to tables and chairs. What Professor Stace's distinction must mean, therefore, is on the one hand that, while non-categorial universals may not apply to all things, yet when they do they apply completely (thus the non-categorial universal *plant* applies completely to the class of plants); and on the other hand that, while logical categories do apply to all things, they do so only partially (thus Quality applies partially to art and the Absolute applies partially to tables). If so, Professor Stace has not adequately expressed the

[1] Hegel: *Op. cit.*, § 43. [2] *Ibid.*, § 44.

distinction, which ought to lie between partial and complete application of universals. Is this distinction, then, to provide the border-line between categories and other kinds of universals? It would seem that all answers to this must be arbitrary since the entities that Hegel himself called categories—the contents of the spheres of Being and Essence—differed very much from one another. There is, it is true, admittedly a greater difference between partial and complete application than between different kinds of partial application; but even if it is correct to reserve the term "categories" for the Logic and not apply it to universals of nature, does the real distinction for which this verbal distinction stands, namely, that between partial and complete application of universals, invalidate the argument of the present paper? I cannot see that it does: for it would seem equally reasonable to expect to find a correlation between historical philosophy and the complete-application universals of the Philosophy of Nature as between historical philosophy and the partial-application categories of the Logic; and Hegel would seem to be overstepping his time in contributing a whole host of complete-application universals every whit as much as if these were like the logical categories.

If these contentions be granted, let us summarize the position in which Hegel's philosophy, as a result of its own inner tenets, now finds itself. It is to be assessed, at most, by his Logic, to which he contributed the new principle of Concrete Mergence or dialectic; he gave to posterity the fruit of 2,500 years of philosophy, the dialectic, completing the Logic that was within sight of completion under Kant. At that time all the categories save those of Concrete Mergence had been discovered, but no method of uniting them (to Fichte, no doubt, is due some of the credit for the discovery of the dialectic, but this is not the place to discuss the weights of their respective contributions, beyond remarking that Fichte's position probably corresponds to Dialectic-in-itself or the implicit form of Concrete Mergence, while Hegel's corresponds to Dialectic-in-and-for-itself or the explicit form of Concrete Mergence). But of course the final category or sphere of categories, Concrete Mergence, and the dialectical method hardly differed from one another—at least the discovery of either without the other would have been impossible; hence no hint of the method was possible from Parmenides to Kant (the triads of the Neo-Platonists, it may be assumed, can scarcely be called hints of what was to come). Thus Hegel, in ending the Logic, both added the last category or sphere of categories and organized the isolated and discrete categories into a whole.

It follows that philosophy up to Hegel's day consisted in the history of logic, and that the history of philosophy remained to be writtten. The category of Philosophy did not occur in the Logic, but in the philosophy of Spirit, so that its real meaning could not then be

known. Thus the history of Logic, or the history of Concrete Mergence, or the history of the Absolute Idea would form a part of the history of Philosophy. In that case it is incumbent upon us to see how these conclusions bear on post-Hegelian thought.

Dialectic, Pre-Hegelian and Post-Hegelian Philosophy.

According to Hegel, philosophy up to his time had always manifested the same character, and, if he were alive now, he would no doubt hold that there was a greater change in its nature after his day than at any other time since philosophy began—an incomparably greater change than the passage from the Greeks to the Scholastics, or from them to Descartes. Before offering any comments on this, let us see what in Hegel's mind would have constituted the difference. What I would suggest as Hegel's opinion is that there was one dominant characteristic (for which it is difficult to find adequate expressions) of all philosophy from Parmenides to Hegel, which is that the main purpose of each philosophy was to find out the *principle of the being* of the universe; and that this purpose did not characterize post-Hegelian philosophy. And I would suggest also that there is correspondingly one dominant characteristic of modern philosophies, which is that their main purpose is to examine the *nature of being or what is*, or, as it has sometimes been expressed, to find out *what the world is like;* and that this characteristic did not belong to any philosophy from Parmenides to Hegel. To make this distinction clear would probably require another paper, and it must suffice here to add one or two explanatory remarks. The principle of being would be something like the transcendental function of the Kantian categories, one of the functions of which was supposed to be such that without them the universe could not exist; it would mark the minimum conditions for the possibility of existence. The opposing principle, which may be called the *principle of constitution*, would describe the "furniture of the earth"—it would determine, for example, whether the universe was composed of sense-data, time, space-time, mind, or sentient experience, if we consider the several answers of Russell, Bergson, Alexander, Croce, or Bradley.

Now if the categories of Hegel's Logic are compared with those of his Philosophy of Nature, it is clear that the former are intended to be principles of being of the universe and that the latter are intended to form the constitution of the world. This gives a hint of the main point, that pre-Hegelian philosophy sought principles of being, while post-Hegelian thought was concentrated on the constitution of the universe. Accordingly when it was stated above that Hegel completed the Logic, it might equally well have been put that he ended the problem that was concerned with the principle of being, leaving it to his successors to find out the principle of constitution.

It would be well to examine from the point of view of this distinction some particular instances from both pre- and post-Hegelian philosophy. The Greeks, for example, sought a principle, pure and simple, as an explanation of the being of the universe. The Cartesians and their successors were pressed with the problem of dualism, that between mind and matter; but even here it was essentially a *principle* that was sought—a principle that could reveal some unity between matter and mind while at the same time recognizing that they were in fact different. The dialectical method had for Hegel the virtue of being the sort of method that would solve at once both the Greek and the Cartesian aspects of the problem. It might, however, be questioned whether in certain individual cases, such as Berkeley, Leibniz, or Kant, *every* philosophy really worked with an ultimate principle as its objective rather than to find out the nature or constitution of the universe. One might say that Berkeley's conclusion asserted that the universe was mental, but recent research has amply demonstrated that Berkeley's aim was to find the principle of the unity of the world in God[1] rather than to tell us what was the constitution of the world—indeed, in his fiery opposition to materialism, it is evident that the world was assumed to be either material or mental and no question arose in his mind about the analysis of these concepts. Leibniz's objective was not the same. Doubtless it was a feature of his system to attain a principle (a *deus ex machina* God), which took the form of a Pre-established Harmony that was to reconcile matter and mind; that monads were hypotheses to account for the existing relationship and difference between matter and mind; but this was not the chief goal of his philosophy, which was to show that the constitution of the universe consisted of monads. Accordingly Leibniz does not fit in very well with the levelling of the history of philosophy that Hegel wished to produce. Kant, however, is the most important difficulty for Hegel in this connexion. The Hegelian reading of Kant is of a transcendental character, with the emphasis placed very much on his ordering of categories and his failure to advance further along the Hegelian road than he did. However, there is a wholly different side to Kant, quite ignored by Hegel, which concerned *the nature of experience.* We may say that in Kant are to be distilled two aims: (1) to discover the conditions for the existence of the universe, and (2) to discover the conditions for coherently systematized experience. Now the latter is something that does not fit our pre-Hegelian scheme, and in fact it would be more appropriate to the post-Hegelian.

If we turn now from the transcendental nature of the period ending

[1] A. A. Luce: *Berkeley and Malebranche*, Oxford, 1934; and "The Unity of the Berkeleian Philosophy" in *Mind*, N.S. vol. xlvi, Nos. 181–2, London, 1937.

in Hegel, we find that, according to the present interpretation, the post-Hegelians are in the stage of Nature; and it is impressive on examination to find that every current mode of philosophic thought is concerned with the actual. Bergson, for example, for whom Life or Time is everything, is assuredly dealing with the constitution of the actual, for it is not a logical principle but a real and active one; and he also answers that the world is peopled with images. Realists are professedly concerned with the make-up of the actual. The Neo-Idealists might be said to describe the constitution of the world in terms of thought or spirit, and Husserl the same—the world is phenomena, to be distinguished, however, from the Kantian sense, for while Kant's aim was to lay down how a world was possible, Husserl, in spite of his connexion with Kant, does not concern himself about this, but is more occupied with facts. It would, however, probably be artificial to force all these philosophers into the class of philosophers of nature, for some of them might well be more adequately described as philosophers of spirit. In that case Hegel's plan for the development of philosophy would fail in yet another respect to correspond with what has happened. None the less, there would be some support for this plan, which implies that immediate post-Hegelian philosophy must be predominantly philosophy of nature, in that there is everywhere a pantheistic flavour. Discussions of God, Freedom, and Immortality are in abeyance among philosophers; but these are *speculative* questions, and were raised only in the *speculative* age up to Hegel. That few discuss the conception of God in relation to philosophy is because the stage of the Philosophy of Nature (according to Hegel) is the pantheistic stage—God immanent in the world. As Hegel put it, God before the world, *i.e.* isolated from it, was the Logic; and in the corresponding period God was always discussed as an Idea or a Concept—all the proofs of the existence of God depended on the objectivity of the idea of God—but God as Nature scarcely interested anyone. If, however, Hegel's great triad were correct, the Philosophy of Nature would pass on to the Philosophy of Spirit: that is to say, current philosophy would complete itself only by passing into a philosophy of spirit, and the abstract question of God as Logic and old speculative problems would return once more in concrete form, concrete, that is, in Hegel's sense in which the third category is the concrete form of the first. To put the matter otherwise: the history of philosophy would reach a point in which God would be deemed beyond both Logic and Nature, i.e. would be Spirit; and philosophical discussion of God would be neither abstract as in, say, the ontological argument, nor pantheistic, but would be Spirit—the Logic made Concrete. Such an idea finds a counterpart in certain religious tenets to the effect that God does not exist in the world but in man; and it might correspond to the finding of modern

dynamic psychology that God is a conception formed unconsciously without the introduction of a literally corresponding environmental reality.

A few comments may be made about the criticism that Hegel's philosophy was "out of touch with reality." By "reality" is meant the world of nature, of physical and organic objects, *i.e.* what corresponds to the category of Nature. The criticism is intended to imply that Hegel's philosophy may be satisfactory as a whole and quite self-consistent, but that even so it has nothing to do with the world as we know it. This might equally well be expressed that his philosophy though a consistent whole was abstract, much as mathematics or formal logic is an abstract, self-consistent whole. It is now not difficult to find an important sense in which this criticism is true; for, if Hegel's philosophy is reduced to no more than his Logic, the criticism amounts to the fact that his Logic is out of touch with the actual or that it is abstract and unrelated to the world as we know it. That Hegel himself knew quite well what the word "actual" denoted, *i.e.* what might be the business of a philosophy of nature, is evident from some of his remarks in the introduction to his *Naturphilosophie*; he ought therefore to fall in with the above criticism, so far as he stood at the stage of the Absolute Idea, not yet become Nature. Thus the criticism "out of touch with reality" means that the Logic *in itself* is *an abstraction* and is nothing apart from that of which it is an abstraction—and this we know to be true from the nature of the dialectic. The notion of the dialectic is one of *retreat*—retreat from the most abstract *back* to the concrete, from which the abstraction has been made. Every category is to a greater or lesser extent abstract, and the dialectical movement consists in shedding its abstractness by which process the next category is reached. Finally thought as a whole, as it culminates in the Absolute Idea, is an organic unity, but as yet abstract, until it becomes the new Absolute Immediacy, which is Nature. If this "thought" could exist in its own right as a thing apart from Nature, no deduction of Nature would be possible. But it is important, on account of various criticisms, to understand thoroughly that the Logic as a whole cannot be an existent on its own account, and that Hegel fully realized that fact; for if the Logic could exist in itself, we should have every right to ask where or when it existed, or what kind of existence it had. But any positive answer immediately hypostatizes thought, and "thought-in-general" does not *exist*; the phrase is simply a shorthand for the coherent or coordinated whole of the Logic, the universal characteristics of things and of thinking, but not expecially related to particular things and particular thinking. This may help to explain Hegel's mysterious thought-in-general, which has puzzled a number of post-Hegelian philosophers.

The Deduction of Nature and Post-Hegelian Philosophy.

There is one further feature of some interest to be noted about the correlation between philosophy and its history from the Hegelian angle; an analogy may be observed between the relation connecting post-Hegelian philosophy with the history of philosophy or Logic up to Hegel, on the one hand, and on the other the relation connecting the Philosophy of Nature with the Absolute Idea. Hegel's philosophy, the philosophy of Logic, was the most complete unity of all the systems in history, but on transition it gave way, as we have seen, to an unconnected and heterogeneous lot of systems that had little in common beyond being post-Hegelian. Similarly the Absolute Idea is a unity, the most complete unity of the Logic, but on transition to the sphere of Nature it became self-dirempted from its unity and passed into the form of disconnectedness that constitutes Nature in its lowest phase. The self-diremption of the Absolute Idea has been so elegantly expounded by Macran[1] that it must be quoted at this point. "Thought must realize itself, or the absolute truth must create a world of facts. But, in the first instance, thought, as Hegel views it, is already a progressive self-realization. . . . And at first sight it is not easy to see the possibility of any other realization. To get any realization of thought beyond what we have already found *within thought*, we must make a new move beyond the Absolute Idea, in which the logical process terminates; but how is such a move possible? And yet it is necessary if we are in truth to get at the fact itself; for the realization of thought within thought gives us not the fact, but only the thought of the fact. . . . Thus the realization of thought within the logical process stops short of the absolute fact. In order to get the fact, what we require is, not any positive content beyond thought—for such there cannot be—but to rid ourselves of the mediation, which is the form of thought in general. The fact demands not an advance but a relaxation. Thought holds taut all its plurality, its content, its categories in the tense clasp of its identity. When it slackens its hold and allows its content—and there can be no other—to fall asunder into the absolute dissociation and externality of space and time,[2] the resultant is the fact. . . . The compulsion by which dialectic drives category into category is relaxed, and they are allowed to subsist on their own account. This is what Schelling meant by speaking of Nature as petrified intelligence."

A Consequence for Politics.

The theme of this paper, apart from any intrinsic interest it may

[1] Macran: *Op. cit.*, pp. 79–84.

[2] "This does not mean, of course, that space and time are there waiting to receive the sundered thought, but that this disintegration of thought is what time and space essentially are."

have, has a certain bearing on matters in a very different field. It is well known that the Prussian theory of the State has been supposed to follow from Hegel's philosophy; and Marx explicitly based the Communist theory of dialectical materialism on Hegel. Now at this point we must ask whether these theories are supposed to follow from Hegel's logical principles of dialectic or from his philosophical opinions that he based upon these principles. The theories seem to follow from *some* of his philosophical opinions (but not others) about the State, but it may be doubted if either the theories or his opinions follow from his logical principles; for according to these a category did not lose its entire character when merged in a higher unity, and so it would not follow that a man should lose his entire nature as a human being in the interests of the State, as would seem to be required on Prussian or Marxian principles. *The State, conceived strictly according to Hegelian principles, would, however, be such as to absorb the individual, but only by reason of expressing the universal features of what is involved in being a person, and it would therefore not be something over against the individual in opposition to his nature and interests.* From the Hegelian point of view the Prussian or Marxian theories *hypostatize* the State into an individual, thus resembling the members of which it is composed, but on a higher plane. The whole tenor of Hegel's philosophy was opposed to the mistake of making into a substance what transcended substance. But, be this as it may, the effect of the argument in this paper, which reduces Hegel's contribution to, at most, his Logic, is that all philosophical inferences from the Philosophy of Spirit are rendered invalid.

In conclusion it should be remarked that, since the purpose of the present paper is to apply a Hegelian principle to Hegel's philosophy, the validity of the notion of dialectic when extended to the history of philosophy has not been raised; nor has that of dialectic itself; moreover, no mention has been made of Hegel's allotting to the categories of Heraclitus and Parmenides (Becoming and Being) an order in his Logic different from the historical order of these two philosophers; nor has his neglect of Indian philosophy been used against him, as well it might, since he gave it no place in the categorial order of the history of philosophy, though some of it strongly resembles his own; nor has his similar disregard for the early Greeks before Parmenides been taken up, as it reasonably might, for he had little right, surely, to dismiss from philosophy philosophical principles, such as that of Thales, because they were material instead of being pure—should we not be justified in asking if they were not genuine *philosophers of nature*? But on the other hand it may be observed that there is a psychological foundation for the idea that philosophy develops by opposition and synthesis; for it is natural that a philosopher would initiate his work in opposition to his predecessor

and that his successor would try to synthesize the two by culling what he deemed to be best in them.

Summary.

The paper opened with an exposition of Hegel's correlation between the logical order of the categories of his Logic and the temporal order of the dominant concepts of the systems that form the history of philosophy. Hegel's view of this history as more than a mere collection of diverse philosophies was explained: he held that its process manifested progress and that truth was an organic growth, whose components expressed it in a one-sided fashion; and these components he linked by dialectic as he did the categories of his Logic. For Hegel there was but one philosophy at different stages of completion, which was one Idea in its totality and in all its individual parts; like one life in a living being, one pulse throbs throughout all its members. Of the commonly held belief that one philosophy refutes another, Hegel asserted that what was refuted was not the principle of a philosophy, but merely the view that this principle should be considered final and absolute; the refutation of a philosophy only means that its limits are passed, and that the fixed principle in it has been reduced to an organic element in the completer principle that follows: that is to say, the history of philosophy is the Absolute Idea expressed in terms of time, its stages being embodied in temporal philosophies.

It was next pointed out that there was an important difference between the dialectic that connected the categories of the Logic and the dialectic that connected historical philosophy. The two forms were distinguished as being *internal* and *external* dialectic. The broad distinction was that internal dialectic proceeded by its own inner logic, while the external dialectic of historical systems had to be asserted by a philosopher: the latter relation would thus have a transcendental rather than a strictly logical necessity.

Now according to Hegel the latest philosophy in time is the result of all the systems that have preceded it and is the truest; and he himself believed he had said the final word. From this it would follow that the existence of post-Hegelian philosophy was logically impossible. This criticism led up to a way of attacking Hegel on his own grounds, so that by modifying his system it would be possible in accordance with his own principles to assert the rational necessity of post-Hegelian philosophy. This was carried out by observing that there was no counterpart in historical philosophy to his Philosophies of Nature and Spirit and that his own system was the historical counterpart of the final categories of his Logic; for the Logic could in no sense be said to have been completed before Hegel's time. Hence in attempting Philosophies of Nature and Spirit, Hegel violated his

own dictum that no philosophy oversteps its own time. This undermines the value of his *Naturphilosophie* and *Philosophy of Spirit,* and is consistent with their being inferior works compared with his *Logic.* It was suggested that Hegel was able to guess at the contents of philosophies of nature and spirit by a simple device, namely by interpreting the categories of his Logic spatially and mentally; and it was shown to be consistent with this view that the *Philosophy of Spirit* should be a better work than the *Naturphilosophie.* The general conclusion at this point was that these works could at best be regarded only as forecasts, as attemps to foresee the unforeseeable, and that Hegel's philosophy must be assessed at most by his Logic alone.

The effect of this criticism on post-Hegelian philosophy was next considered, and it was noted that for the Hegelian there was a greater change in the nature of philosophy after Hegel than at any other time previously. The contrast was roughly described as that between principles of being and principles of constitution; it involved, however, assumptions about historical philosophy, particularly as regards Leibniz and Kant, that are at variance with historical facts. Post-Hegelian philosophy was revealed as being, broadly speaking, pantheistic in flavour. As a consequence of the general criticism, it was shown that the well-known opinion that Hegel's philosophy was out of touch with reality was in an important sense true. The limitation of his system to his Logic led, moreover, to an interesting analogy between this and his Philosophy of Nature on the one hand and pre-Hegelian and post-Hegelian philosophy on the other: that is to say, there was a resemblance between the famous deduction of Nature from the Absolute Idea and the disconnected character of philosophy after Hegel's time.

Finally it was pointed out that the conclusions of this paper rendered it impossible to deduce Prussian or Marxian theories of the State from Hegel's logical principles.

The basis of the paper, it must be stressed, is to criticize Hegel's dialectical theory of historical philosophy from an angle that he himself might reasonably be expected to accept; and this is founded on Hegel's own conception of triads. But, though this may allow Hegel his Logic as his contribution to philosophy, it must not be supposed that the argument, in reducing his system to his Logic, in any way fortifies his Logic: other considerations, connected with this paper or otherwise, might reduce his system still further; and in fact certain things were mentioned that do weaken his position, such as his attitude to Indian philosophy, that of the early Greeks before Parmenides, that of Leibniz and Kant, and the question of historical priority with regard to Parmenides and Heraclitus.

WHY DO ARCHIMEDES AND EDDINGTON BOTH GET 10^{79} FOR THE TOTAL NUMBER OF PARTICLES IN THE UNIVERSE?

G. BURNISTON BROWN, M.Sc., PH.D.

THERE have been two attempts in the history of human speculation to estimate the number of particles in the universe. The first was that of Archimedes of Syracuse about 216 B.C., and the second that of Sir Arthur Eddington nearly two thousand years later. What is surprising is that they both arrive at the same number. This is the number obtained by multiplying ten by itself seventy-nine times.

Now, of course, the problem is not stated in exactly the same way by Archimedes and Eddington since they belong to late stages in two entirely different cultures, the Classical Greek and the Gothic or Western European, and in the difference in statement can be seen the difference in world view of the two cultures. When the Greeks looked up at the night sky, they felt that surrounding them at a very large but finite distance were the fixed stars spread over the surface of a sphere, called the "sphere of the fixed stars."[1] This view had come from Aristotle, and it seems likely[2] that Archimedes, who belonged to a later and more sceptical age, adhered to it, although he did not find repugnant, as the earlier Greeks had done, the modification introduced by Aristarchus of Samos that it was the sun that occupied the centre and not the earth, and he did not take estimates of distances and sizes very seriously, as we shall see. To him, then, the universe was finite; but to understand why he was interested in calculating how many grains of sand it could contain, which is what he does in his treatise entitled *The Sand-Reckoner*, we must consider the Greek number system.

To the Greeks numbers were symbols of things perceptible to the senses, representing visibly limited and tangible units, and consequently there could be only positive and whole numbers and no zero. Number as power or index could not extend beyond 2 and 3, for these represent optically realizable and measurable areas and volumes—Eudoxus called them *face* and *volume* numbers. The seventy-nine in 10^{79} could not be a number since it symbolizes an *operation*, i.e. it tells us to multiply ten by itself seventy-nine times, and is not a visibly limited thing. One consequence of this number

[1] This feeling can be recaptured with a little practice.

[2] Cf. Sir Thomas Heath, *Aristarchus of Samos*, p. 221 (1913).

system was the well-known difficulty that if the side of a square was represented by a number, the diagonal could not be; and another was that very large numbers became unusable owing to the difficulty in symbolizing them, since the Greeks used letters of the alphabet to symbolize numbers and never discovered the advantages of the position system whereby, for instance, the symbol for eleven can be made from the symbol for one. In the Greek system the first one in eleven was a different letter from the second.

Now, according to Archimedes, there were traditional names for numbers up to a myriad (10,000), so that the Greeks could express numbers up to a myriad myriads (100,000,000). It was Archimedes' ambition to show that he could devise a system whereby numbers so large could be expressed that they would equal the number of grains of sand in the universe. In this way he was bringing to perfection and fulfilment the Greek *number-idea*, since numbers represented tangible things, and if he could show that numbers encompassed all the smallest of such tangible units known (grains of sand) in the finite universe, then clearly the system was adequate for all problems that could arise in the Greek world-view. This, I think, must be taken as Archimedes' object: consequently his treatise is really concerned with the number-system invented rather than with physics or astronomy, and this accounts for his great readiness to increase any estimates of sizes and distances made by the astronomers of those times. For instance, he multiplies the then current estimate of the earth's perimeter by ten, all this being to demonstrate that even if the size of the universe is overestimated, his system will still be adequate.

In order to understand Archimedes' treatise we must first compare the accepted Greek view of the universe with that of Aristarchus of Samos. The accepted view was that the earth was spherical and occupied the centre of the universe which was bounded by a sphere in which the fixed stars and the sun moved (Fig. 1). Aristarchus maintained that the sun was at the centre of the universe and that the earth moved in a sphere surrounding it, its path being a great circle of the sphere (Fig. 2). The fact remained, however, that the stars appeared to remain fixed relative to one another, and this could only be so, when viewed from a moving earth, if they were at a very great distance. Consequently Aristarchus put the stars in a sphere whose diameter was so great that the diameter of the earth's orbit in relation to it was as "the centre of a sphere to its surface." This, according to Sir Thomas Heath, was a common expression amongst Greek astronomers to express *incomparability*: it meant that the ratio of the diameter of the sphere of the fixed stars to that of the orbit of the earth could not be expressed by a number.

As we have seen, Archimedes was anxious to demonstrate his new

system of numbers, and consequently he wished to make it the more convincing by using the largest estimate of the universe which had so far been put forward, which was that of Aristarchus, even though it were not the popularly accepted one. This laudable intention was rudely checked by Aristarchus' remark that its size was incomparably greater than that of the earth's orbit. This, of course, did not suit Archimedes' purpose, so he proceeds as follows:

"Now it is easy to see that this is impossible; for, since the centre of the sphere has no magnitude, we cannot conceive it to bear any ratio whatever to the surface of the sphere.[1] We must, however, take Aristarchus to mean this: since we conceive the earth to be, as it were, the centre of the universe, the ratio which the earth bears to what we describe as the 'universe' is the same as the ratio which

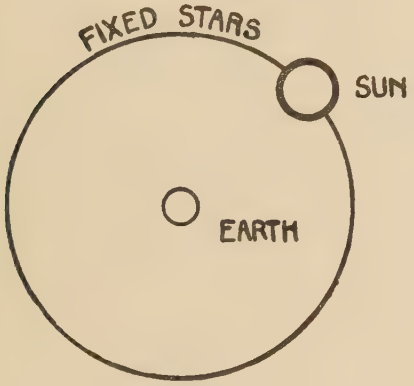

FIG. 1.—Greek universe.

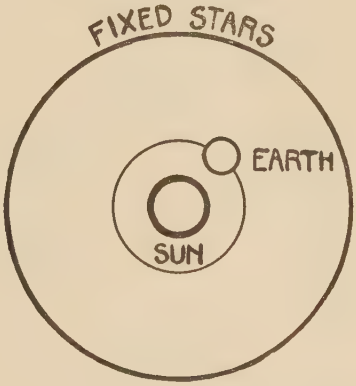

FIG. 2.—Universe of Aristarchus of Samos.

the sphere containing the circle in which he supposes the earth to revolve bears to the sphere of the fixed stars."[2]

Archimedes, therefore, seems to maintain that the correct argument should be, not that the distances are incomparable, but that if the diameter of the Greek universe was sufficient to ensure the unchanging appearance of the stars as seen from different points on the earth's *surface*, then the corresponding diameter for Aristarchus' universe, which must be unchanging for different points of observation in the earth's *orbit*, would be greater in the ratio of the diameter of the earth's orbit to the diameter of the earth. This is not a logical argument because, in fact, the distance of the stars was taken to be the same as that of the sun and was not estimated from any considerations of immutability. Logic, however, is more often the

[1] Note absence of idea of *infinity* as a number.
[2] Sir Thomas Heath, *Archimedes*.

servant than the master of the will even with the choicest philosophers, and Archimedes, anxious to show off his new system to King Gelon of Syracuse, is no exception.

The arguments which follow are entirely related to the Greek universe, and so we need not consider Aristarchus' universe further: we must merely bear in mind that when we have calculated the diameter of the universe we must multiply it by the ratio which the earth's orbit bears to the earth.

The chain of reasoning whereby the universe and a grain of sand

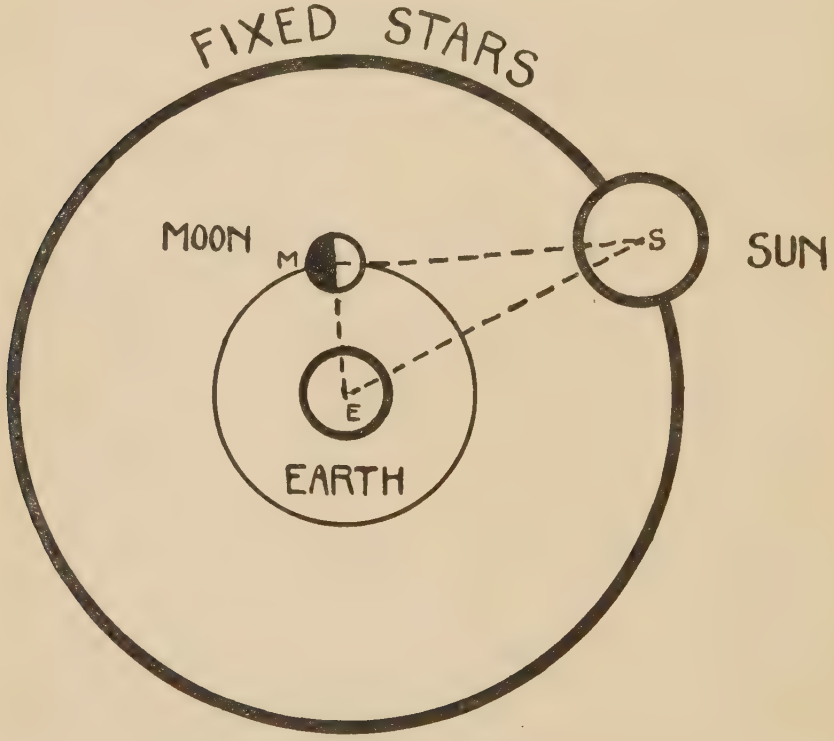

FIG. 3.—At half-moon Aristarchus took the angle SEM to be 87°.

are made to enter into numerical relationship is illustrated in Fig. 3, and consists in the determination of the following proportions:

(1) Ratio of the diameter of the universe to that of the sun.
(2) Ratio of the diameter of the sun to that of the moon.
(3) Ratio of the diameter of the moon to that of the earth.
(4) Number of Greek stadia in the perimeter of the earth.
(5) Number of finger-breadths in a stadium.
(6) Number of poppy-seeds in a finger-breadth.
(7) Number of grains of sand in a poppy-seed.

Let us consider now in detail how these various proportions were estimated. To determine the first ratio Archimedes made an experiment which consisted in sliding a disc along a beam until its distance from his eye was just such as to obscure the sun: the angle subtended by the disc at the eye then gave the angle subtended by the sun (Fig. 4). Archimedes made allowance for the fact that the pupil of the eye is not a point and arrived at a value of "less than $\frac{1}{164}$th and greater than $\frac{1}{200}$th of a right angle"—or very close to half a degree. This agreed well with an estimate which, he says, was made by Aristarchus, who got "$\frac{1}{720}$th of the circle of the zodiac." Earlier Greek estimates, obtained by timing the appearances of the sun's upper and lower limbs at sunrise, had been badly out, giving a value of two degrees.

Archimedes now goes on to show that the sun's diameter of $\frac{1}{720}$th of a complete circle must be greater than the side of a thousand-sided

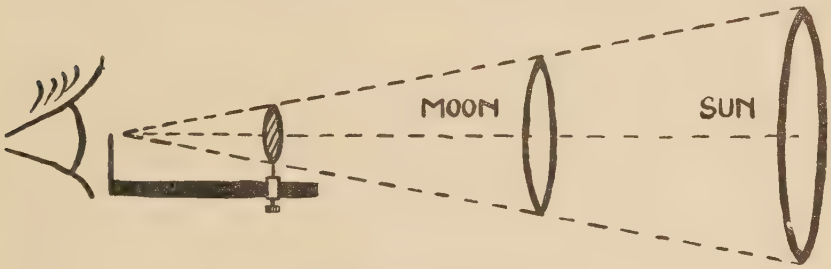

FIG. 4.—Archimedes' disc slides along the bar until it just obscures the disc of the sun or moon. The angle subtended by the disc at the eye is then equal to that of the sun or moon. Since the latter are nearly equal, the diameters are in the ratio of the distances.

regular polygon (a "chiliagon") inscribed in the circle. Then follows the geometrical theorem that *the perimeter of any regular polygon with more sides than six is greater than that of the inscribed regular hexagon, and therefore greater than three times the diameter.*

Thus we have:

(perimeter of chiliagon) is *greater than* (three times the diameter of the universe)

or

(diameter of universe) is *less than* $\frac{1}{3}$ (perimeter of chiliagon),

so that

(diameter of universe) is *less than* $\frac{1000}{3}$ (diameter of the sun).

The next assumption Archimedes makes is that:

(diameter of sun) is *not greater than* 30 times (diameter of moon).

This, he says, follows from the work of Eudoxus, his own father Pheidias, and Aristarchus. The greatest estimate was that of Aristarchus (18 to 20), and he chooses thirty in order to exceed this liberally. Now the very erroneous value of between 18 and 20 (it should be about 109) was obtained by Aristarchus in his celebrated treatise "On the Sizes and Distances of the Sun and Moon" from the following observation—"that when the moon appears to us halved, its distance from the sun is then less than a quadrant by one-thirtieth of a quadrant." In Fig. 3, which illustrates the case of half-moon, this means that the angle SEM was observed to be $90° - (\frac{90}{30})°$ or 87°. This is a very difficult measurement to make with any accuracy, and the correct value is nearer 89° 50′. Using the value 87°, Aristarchus by a laborious geometrical proof[1] arrived at the result:

(distance of sun) is *less than* 20 and *greater than* 18 times (distance of moon).

Then Aristarchus made the inference that the sun and moon subtend the same angle at the earth: this he did by noting that the phenomena of total eclipses show that the moon subtends a larger angle than the sun, but that as the total eclipse lasts for such a short time, this angle is only very slightly larger. It is evident from this argument that Aristarchus had never heard of annular eclipses, that is to say, eclipses in which the sun is very nearly but not quite completely obscured and remains shining as a thin ring of light round the moon. Archimedes does not mention them either, and it seems likely that they were not recorded until several centuries later.

Now if the sun and moon are of the same angular diameter, then their diameters are in the same ratio as their distances (Fig. 4). Consequently Aristarchus arrived at the conclusion:

(diameter of sun) is *less than* 20 and *greater than* 18 times (diameter of moon).

Archimedes, making use of this and generously writing 30 for 20, therefore obtains

(diameter of sun) is *less than* 30 times (diameter of moon),

and remembering our first result we now arrive at

(diameter of universe) is *less than* 10,000 times (diameter of moon).

Aristarchus in his great treatise had also been at pains to obtain a value for the ratio of the diameter of the earth to that of the

[1] Nowadays we should use trigonometry and say distance of sun divided by distance of moon is secant 87° or 19.

moon, but it was sufficient for Archimedes' purpose to know that the earth was larger than the moon, and this, he says, follows from the fact that in an eclipse of the *moon* the diameter of the earth's shadow is twice that of the moon's diameter. This, presumably, was based on observation of the time taken for the moon to traverse the earth's shadow. Making use of this information we can now write:

(diameter of universe) is *less than* 10,000 times (diameter of earth).

With this result we end our heavenly excursions and return with

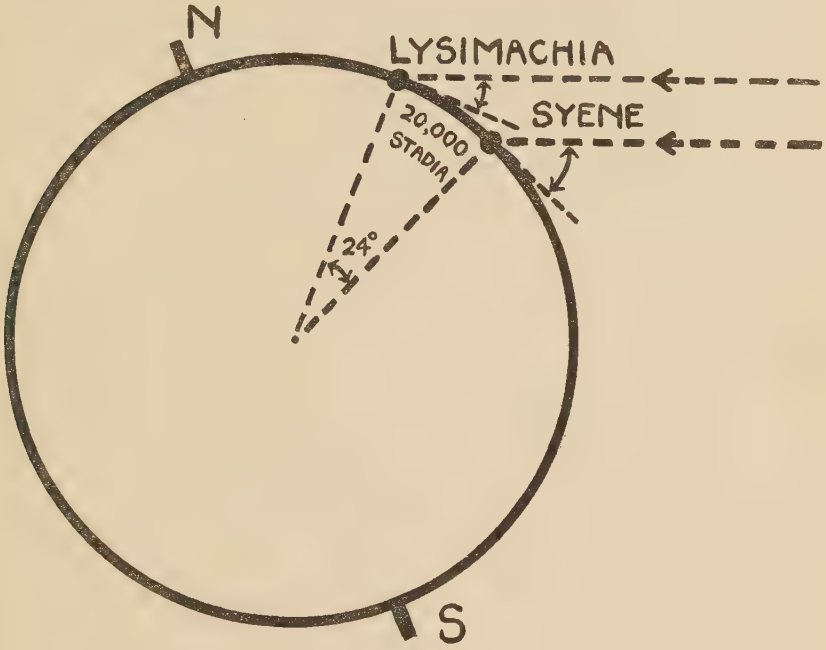

FIG. 5.—The difference in altitude of the sun at noon on the same day at Syene and Lysimachia was found to be 24°. This is the same as the angle between the radii passing through the two places. If 20,000 stadia is the length of arc subtending 24°, then for the whole perimeter we must have 300,000 stadia.

Archimedes to earth and proceed to inquire: What is the number of Greek stadia in the perimeter of the earth? With regard to this question Archimedes merely says, "Some have tried to prove that the perimeter of the earth is not greater than 300,000 stadia," and in pursuance of his policy of overestimation he takes himself the figure of 3,000,000 stadia. (A stadium was rather less than one-tenth of the English mile.) The estimate of 300,000, Sir Thomas Heath thought, was almost certainly that of Dicaearchus, who took 24° (a fifteenth of the whole meridian circle) as the difference in latitude between Syene (now Assuan) in Upper Egypt and Lysimachia (now

Ecsemil) in the Dardanelles, and 20,000 stadia as the actual distance (see Fig. 5). More correct values would now seem to be 17° and 11,000 stadia, but as both Dicaearchus' values are too large the final result of 300,000 stadia is not very far out.

Remembering the theorem that the perimeter must be greater than three times the diameter, Archimedes can now write:

(diameter of earth) is *less than* $\frac{1}{3}$ (3,000,000 stadia)

and we now arrive at

(diameter of universe) is *less than* 10,000,000,000 stadia.

The relation between stadia and grains of sand is established by the following comparisons, which do not call for much discussion:

One stadium is *less than* 10,000 finger-breadths.
One finger-breadth is *less than* 40 poppy-seeds.
A poppy-seed contains *less than* 10,000 grains of sand.

The latter estimate is extremely generous; the finest sand from Kynance Cove in Cornwall, for instance, would only allow a poppy-seed to contain about 500 grains. However, Archimedes is now in a position to achieve a grand and generous total, which without a great strain on our powers of arithmetic can be shown to be 10^{63}, or ten multiplied by itself sixty-three times. This is the total number of grains of sand which could be contained in the universe.

Archimedes' system of expressing large numbers was as follows: traditional names exist for numbers up to a myriad myriads (10^8); call these *numbers of the first order*; let a myriad myriad be the unit of a *second order* so that this will extend up to a myriad-myriad-myriad-myriads (10^{16}); again, let this last number be the unit of a *third order*, and this order will therefore rise to what we should call 10^{24} and so on.

In order to make a comparison with the calculation of a similar nature by Sir Arthur Eddington, we cannot remain satisfied with the number of grains of sand, but must endeavour to determine the number of "particles" in a grain of sand. Now the word "particle" in present-day physics is a word which is so elastic that a definition of it is hardly possible. In the great days of classical physics it was an impenetrable and eternal object, but nowadays it may turn into waves or disappear abruptly after existing for only a millionth of a second. However, there are two particles of which atoms of matter are generally supposed to consist—protons or positively charged hydrogen nuclei, and electrons, the smallest units of negative charge. Now sand may be taken as consisting of crystals of quartz, which is a substance composed of molecules of silicon and oxygen, and these

molecules each contain 120 particles (protons and electrons). From X-ray measurements of quartz crystals we know the volume occupied by each molecule, so that we can easily calculate the number of particles in a given volume.

At this point we are somewhat hampered by lack of knowledge as to the length of the Greek stadium, and our information with regard to poppy-seeds and grains of sand in Syracuse is even more scanty. We must fall back therefore on the human finger-breadth, and assuming that the fingers of natural philosophers do not vary greatly through the ages, I have measured my own and find them to average 1·6 centimetre. Beyond the advantage that my own fingers were close "at hand," the use of the fingers of an Englishman will help to redress the over-emphasis in physics which has been accorded to the thumbs of three Scotsmen.[1] Using this value for a finger-breadth, Archimedes' estimate for N, the number of particles in the universe, would have been 10^{79}. As has already been observed, this is in gratifying agreement with the result recently obtained by Sir Arthur Eddington.

We must now move on two thousand years and inquire how it comes about that a second estimate of the number of particles in the universe has been attempted and what is its significance to-day. As we have said, Eddington is writing in a late stage of Western European culture, just as Archimedes wrote in a late stage of the development of Classical culture. The age of heroics—such as the boast that given the position, velocity, and mass of every particle in the universe the whole of the future could be calculated—is long over. It is the age of scepticism and undermining of beliefs which in an earlier time were held unquestioningly. Just as Archimedes was very liberal with all estimates of distance handed down from his predecessors, so Eddington does not believe that N is the result you would get if you could count all the particles.

We must pause a moment for a brief survey of the most important difference between the Greek view of nature and our own. This concerns the development of ideas with regard to *space*. To the Greeks, who had no word for space, it was just the "void," and the things that mattered were the tangible, visibly limited objects which were separated and made distinguishable by the void. All bodies exhibited a scheme of perfect geometrical relationship which could be expressed by ratios of whole numbers, and if disturbed would tend to move "to their appointed places." The object of a natural philosopher was to demonstrate the perfection and expose the preordained plan. How different was the Gothic view, culminating with Faraday and Maxwell, which placed the seat of all actions in the

[1] The inch is the mean measure of the thumbs of three Scotsmen in the reign of King David (*c.* 1150).

"void" and made the observable objects mere puppets pulled here and there by tensions in invisible wires. The whole of space was filled with forces, and the observed behaviour of bodies was viewed against a background of gravitational, electrical, and magnetic tensions; even a state of rest was attributed to the forces just balancing!

The contrast between the sharply defined, tangible units of the Greek world and the emergence of the background of infinite space and infinite time is shown very clearly by the classical statue and the oil paintings of Rembrandt and Turner. There is nothing dynamic about the classical statue; it exhibits the relationship of clearly defined parts to one another; and it has no pupils in its eyes, for these suggest depth and not *form*. Compare this with a Rembrandt portrait, which even though it is a portrait has no foreground; the body is no longer sharply defined, but merges into the dark-brown background—dark brown is the colour of things which have depth in time—and the person painted is usually old. It is the portrait of a body with a history seen against the background of infinite time. The classical statue is a body among bodies, sensuously present. In Turner's paintings we see castles and cities lost against a background of infinite space—a space full of mysterious light. If ever anyone painted Maxwell's electromagnetic equations for "free space," it was Turner.

This continual filling up of space with forces of various kinds—"field theory," it was called—was bound to lead to difficulties, and it was these difficulties associated with the aether that caused Einstein to put forward his theory of relativity. In this theory Einstein adopted Minkowski's idea of a four-dimensional continuum with time represented as a fourth dimension, so that the three-dimensional space of Faraday and Maxwell full of forces became a four-dimensional "space-time" whose geometrical properties were the cause of the phenomena of gravitation and (later) electromagnetism. The use of space-time as a cause by the relativists is of course just as objectionable from the point of view of scientific method as Newton's use of absolute space as a cause (of the bulging of rotating bodies), since both are unobservable; but we must put up with this, as we have reached the point where we can begin, with Eddington, the long chase which trails across the universe in search of N, the total number of protons and electrons.

Now if we take the universe as a whole, astronomical evidence shows that the matter in it is spread more or less uniformly, and in such a system there was nothing in Newtonian mechanics to prevent both bodies and radiation escaping continually into infinite space. Einstein saw that, by adding a term to his expression for the law of gravitation, he could make the four-dimensional universe spatially finite—that is to say, a ray of light would, after an enormous lapse

of time, arrive back at the starting-point. The common analogy is with the two-dimensional surface of the earth which is curved in the third dimension, and on which, although there is no boundary, it is not possible to travel more than about 24,000 miles in the same direction without returning to the starting-point. This, then, is the first hint at limiting the otherwise infinite space available for the motion of matter and light, and Einstein admitted that the extra term which he had added, and which contained the now famous "cosmical constant λ," was not justified by anything in our knowledge of gravitation.

At this point we ought to notice the fundamental difference between the object of Archimedes and Eddington's calculations: Archimedes did not estimate the number of grains of sand actually in the universe, but only the number that *would* fill the universe. It was essential for him, therefore, to know the volume of space to be filled. He was not interested in the actual number of particles; that would be physics, and Greek physics never amounted to very much. He was interested in his system of numbers. But for us the problem is a physical one: we want to know the total number of protons and electrons, and as we can see that the whole of space is not filled with them, it is not obvious that we require to know the radius of the finite universe. Einstein originally suggested, however, that the radius of his spherical universe might be dependent on the amount of matter within it, and this resulted in an expression giving the radius of the spherical universe R in terms of the total mass, and thus in terms of the number of particles N.

And then a curious thing happened: it was found that the large masses of the universe (the spiral nebulae) all seemed to be receding from us with velocities proportional to their distances from our galaxy. The cosmical constant λ, therefore, which had been introduced *ad hoc* by Einstein in order to keep the universe together, was no longer necessary, and Einstein proposed to drop it. But Eddington showed that Einstein's universe was not a stable one anyway, and that it would tend to contract or expand; consequently, on the expansion being observed, he now makes use of λ as a measure of the repulsive force causing the expansion—a complete reversal of the function it was meant to fulfil when first introduced.

But Eddington has a more profound reason for retaining λ, which causes him to regard Einstein's suggestion of dropping it altogether as "an incredibly retrograde proposal," and to say that, without it, the theory of relativity would not be a relativity theory. This he first expressed by saying, "An electron could never decide how large it ought to be unless there existed some length independent of itself for it to compare itself with."[1] This is not the kind of statement

[1] *The Mathematical Theory of Relativity*, p. 154 (1924).

that orthodox physicists like at all; Einstein would never have made a statement smelling so much of metaphysics. But, for all that, the unorthodoxy of one who is feeling his way, is better than the orthodoxy of one who is feeling he's stuck. And it is through his interpretation of λ—viz. that it fixes a radius for spherical space, and thus gives a meaning to measurement—that Eddington succeeds in uniting astronomy and atomic physics. Ordinarily, of course, the universe is compared with an arbitrary length like the yard, and so is the atom. But the yard is the length of King Henry I's arm, and no one in these democratic days is going to attribute anything very fundamental to that. Eddington, therefore, resorts to a process which he calls "eliminating King Henry I": this is a mathematical process and should not be confused with another one, also applied to high personages, which is known as "liquidating": this is a physical process.

We have, then, by retaining λ, got an equation between the radius of the universe and the number of particles within it. We are now in a position to enter the atomic field and establish another equation between them, so that by substituting from one in the other we can get either R or N. To do this we shall have to leave Einstein even further behind. In fact, we may make the subtle but important distinction to which we became accustomed during the Spanish war: if we call Einstein and Planck *Insurgents*, then Eddington is a *Red.* He has even ventured to doubt whether the great Lord Rutherford discovered the nucleus in the atom—he thinks he may have *put it there.*[1] Impiety could not sink lower than this!

Holding tight onto Eddington's hand, therefore, we descend into the underworld. Before we do this a few words of introduction are necessary. Since no one has ever seen a proton or an electron they must be hypothetical particles, and we can only consider their activities by *imagining* what may happen to them in a "theoretical experiment"; that is to say, in an imaginary experiment which cannot be done in practice owing to our clumsy large-scale methods. We know, for instance, that light exerts a pressure, but we have hitherto supposed that we could imagine the intensity of the light cut down and down until it did not knock the electron about too much, and thus we could, in theory at least, observe what an electron was doing and measure its position and velocity. But the idea that the intensity of light can be cut down indefinitely has proved to be contrary to the laws of nature; we can either have no light or a certain amount of light, and *nothing in between.* Consequently the electron is bound to be knocked about to a certain extent by the most careful observation, and we cannot hope, even in a theoretical experiment, ever to know its exact position or velocity. How can such indefiniteness be dealt with scientifically?

[1] *The Philosophy of Physical Science,* p. 109 (1939).

A method of treatment known as *wave-mechanics* has been developed in which our exact knowledge is represented by probabilities. We do not know exactly the position or the velocity, but we know exactly the probability that the position is within certain limits and the velocity within certain other limits. An electron in space is therefore represented mathematically by a "probability-distribution" stating the chance of finding it in a given region. If another electron appears, we should expect the first one to be repelled since both have a negative charge of electricity: this means that its position and velocity will alter, but in our new language of wave-mechanics we say that the probability-distribution of the first electron is altered so that the chance of finding it in a certain region is now different from what it was. Similarly, if other electrons or protons are introduced the probability-distribution again alters.

Now this is all very well, says Eddington, but what is its original probability-distribution before the others appeared? What are the chances of finding an electron in free space? If the space is infinite, it is like looking for a golf-ball in an infinite gorse-bush; the chances of finding it are nil. That is why Eddington sets a limit to the gorse-bush and takes the universe to be spherical and finite: then the electron cannot be further away from the centre than R the radius of the universe, and if we take the electron as our reference point for describing the position of the second electron, the uncertainty of its position is R. And further, says Eddington, you never really have an electron alone; it is surrounded by the universe, by all the other electrons and protons—in fact by N of them! This results in the uncertainty of position being reduced to $R/\sqrt{N}$ because although we are still just as ignorant of the position of the first electron, all electrons being by hypothesis exactly alike, we cannot tell which is which, and so we take the one nearest to hand. If a gorse-bush contains several golf-balls *all exactly alike*, the chances of finding a ball in the region you are beating about is greatly increased, and naturally you will say that it is *your* ball.

We have now got a starting-point for our theory of atomic phenomena, for, as we have seen, the effect of attraction and repulsion of other particles on our original particle is described by the modification of its probability-distribution which is produced, and as this is a process of multiplication it would be useless if the original probability-distribution were zero. In Dirac's theory of wave-mechanics, King Henry I was hanging about somewhere in the background, but was not specifically introduced. Eddington has introduced him and eliminated him all at one blow and left us with a direct connection between the radius of spherical space and the extension of the electron.

But we never measure the *size* of an electron, so we cannot stop

here but must try to obtain a relation with something that we do measure. Now what we can measure is the ratio of the factor which determines the behaviour of a particle when in the neighbourhood of charged particles (the charge e) to the factor which determines the behaviour of the particle when in the neighbourhood of uncharged particles (the mass m). We can do this experimentally for both the proton and the electron, and thus get e/m_p and e/m_e. Our relation, however, connects the universe with the uncertainty in position of the electron, not its mass, so we must make use of the principle of indeterminacy to put things right. This principle, which is based on experiment, tells us that the uncertainty of position multiplied by the uncertainty of the momentum has a certain minimum value h. Consequently, with our uncertainty of position $R/\sqrt{N}$ goes a certain irreducible momentum of the order h divided by $R/\sqrt{N}$, and we get the corresponding mass by dividing by the velocity of light. This is the mass in terms of which, according to Eddington, the masses of the proton and electron are ultimately measured. So now at last we have a connection between the masses of the proton and electron and $R/\sqrt{N}$. Substituting for R from the relation we found from Eddington's theory of relativity we finally arrive at

$$N = 3{\cdot}15 \times 10^{79}$$

for the total number of protons and electrons in the world. We ought to add that Eddington has now given very profound reasons for thinking that the actual number is

$$N = 2 \times 136 \times 2^{256}$$

so that he can calculate the number to the last digit.[1]

This, then, is Eddington's value for a number which no one will ever count, and he admits quite frankly that if he thought there was the slightest chance of anyone being able to do so, even in a theoretical experiment, he would withdraw it at once. For it is a number of the kind that cannot be counted, like Avogadro's Number which purports to give the number of molecules in a cubic centimetre of gas. Even if we imagine ourselves so reduced that we could sit on a molecule, we could not count the others as they fly past, since they are all alike and we could not tell after a time whether or not we were counting the same particle over again. Numbers are put into nature by the physicist, and all Eddington says is that by examining the way in which these numbers are put in (by the use of measuring rods and clocks) he can tell what sort of number is going to come out. Take the colour of a daffodil, for instance; that does not suggest a number of any kind, and yet the physicist has a

[1] See *The Philosophy of Physical Science*, p. 170.

set of numbers for describing "accurately" its hues. Clearly he must have put them there himself, for no amount of examination of a daffodil will disclose a number. But, it may be said, there are some numbers in nature which are independent of our experimental procedures: for instance, the number of the planets, which *is* obtained by pure counting. This is quite true, and it is these numbers which Eddington does not pretend to be able to predict; they are part of physical knowledge which is not in the form of a *generalization* and are not included in *laws of nature.*

If we may revert to the language for which we are indebted to Scottish culture, we can describe Sir Arthur Eddington as a *super-caddy.* He watches very carefully how the player (the physicist) holds his club (the measuring rod); he notices his stance (experimental set-up) and casts an eye at the direction of the wind and the state of the ground (experimental conditions). He then calculates that there is a high probability that the ball will end up in the gorse-bush on the right of the green. From his point of view there is really no need for the player to resort to experiment and actually play the shot at all. Anyway, by the time that the player has finished addressing the ball, Eddington is well on the way to the gorse-bush, and consequently, when the ball drops there, he has a much more accurate knowledge of its position than the more orthodox caddies who wait until the shot is played and then resort to *experiment* to find it, a method nearly always laborious and which has been known to result in complete failure.

Archimedes, who is watching from a cloud far above this earthly scene, thinks that at last he may be able to understand what is going on, for Eddington seems to have re-adopted the deductive method and to be dealing only in pure numbers. There is none of that inducto-deductive nonsense propagated by Lord Chancellor Bacon, and the numbers are not absurd ones which go on and on without ending like the square root of two. He never could understand why the "void" had to be filled with invisible *forces* doing *work,* and everywhere there was stored up quite unobservable *energy*: still less could he understand why the test of a good theory should be that *it* should work too, i.e. lead to fresh knowledge. There was quite an uncomfortably large number of facts to be brought into "harmony" as it was, without poking about to find others which were bound, sooner or later, to upset the scheme and thus defeat its own ends.

Archimedes is about to descend to have a sympathetic chat with Eddington, when he overhears him saying, "N is not a number of the kind that you count—if I thought you could count it I should know it was wrong!" This is really too much: he could not realize *number as function* or *number as operator,* but number as *uncountable*

shows him the immense gulf that separates his ideas from those of Eddington: the digits are the same, but the numbers are utterly different.

It is the difference between the static classical statue and the dynamic restless figures of Rodin; it is the difference between the fleshly tones of the harp and the space-filling thunder of the organ, between the simple melody of the lyre and the counterpoint of Bach, between the sharp, brightly coloured figures of the Greek vase and the ill-defined figures of Rembrandt dissolving into a dark background of infinite time. It is the difference between the world-view of Classical Greece and that of Western Europe.

"IN THE BEGINNING . . ."[1]

B. A. FARRELL, M.A., B.Litt.

There is a curious reluctance in many quarters to try to apply to the philosophical questions the ordinary person in the street is continually raising, the technique and results of recent logical and philosophical analysis. Ordinary persons like Uncle Tom and Aunt Mary persist in asking questions about the meaning of the Universe and the destiny of the individual. Yet, on the whole, the only answers that are offered come from those quarters that find themselves to-day increasingly out of tune with the temper and idiom of the times and more and more out-manœuvred by the "talkie" and the gossip columnist of the gutter press. This situation has certain unfortunate results, and consequently imposes on philosophical analysis a special function at the present time.

The purpose of this article is to take one of the questions Uncle Tom frequently raises, and to try to show by way of illustration, albeit very inadequately, what can be done to provide an answer that, *per contra*, is in keeping with the hard-boiled age of gangsterdom in which we live, and that at the same time "does not depart from the truth" more than circumstances necessitate. One of these circumstances we may as well note at once. We shall try to give an answer that is comprehensible to Uncle Tom as a man in the street, and that is reasonably complete in itself. This means that it must not be too far above the level of the commonsensical. Given such a purpose there seems no escape from this inadequacy.

The question is this. "When did the Universe begin?" Before we can proceed to answer it, we have to be clear about its nature and about the sort of answer that we want. It is obviously futile to ask a question if, for example, it should happen to be logically impossible to provide an answer.

Let us begin by considering what Uncle Tom means by the words "the Universe." It seems clear that he is using it to refer to one something only. Hence, it is a singular name. Of such names there are two sorts—proper and uniquely descriptive. The former are significant because they name an object. The latter are significant because they uniquely describe one something by attributing to it an exclusive characteristic or set of characteristics, e.g. the King of England. It is evident that "the Universe" is not a proper name,

[1] A lecture given to the Philosophical Society, the University of the Witwatersrand.

as the words certainly have a conventional usage in the way that, say, John Howard Mortimer, whoever he may be, if he exists, have none. Hence, it is uniquely descriptive. Further, it seems obvious that it is a collective name, since it refers to a set of somethings, whatever these may be, regarded as a unity. For Uncle Tom is clearly concerned with a collective whole that is unique. So in this question the words "the Universe" function as a singular, uniquely descriptive, collective name.

Now, as "the Universe" is a descriptive name, we have to determine what the characteristics are by means of which Uncle Tom uniquely describes the unique collective whole in question. In other words, what does he ordinarily mean by the words "the Universe"?

Here we are obliged to be somewhat arbitrary. There seems to be no *one* set of characteristics that we *all* use, and so no one collective whole that is invariably designated. For the words appear to have different usages. And we have no time to select more than the following two obviously important ones.

(i) The unique collective whole constituted by the present order of nature.

(ii) The unique collective whole constituted by the flux of any events whatsoever, whether forming the present order of nature or not.

In both these cases we are talking about a unique continuant. But in (i) its life history is constituted by the flux of events in those relations that we call the order of nature, whatever the defining characteristics of this order may be. This is not very precise as it stands, as the defining characteristics are not stated. Until this is done, the original question in this usage of the words "the Universe," cannot be answered. In (ii) the life history is made up of any events whatsoever, whether or not they are also related in such ways as to form an order of the same sort as the present order of nature. Still, because they are events it follows that they must be related in temporal relations.[1]

But it seems obvious on inspection that Uncle Tom never contemplated this distinction between (i) and (ii) when he asked the question. He did not do so because it seems evident that he is concerned with the beginning of "everything," not merely with the beginning of the present order of nature. (i) only seems to be important as a philosophic usage. It is (ii) that appears to be important as a fairly common usage of the plain man. Hence, we shall adopt it for the purpose of answering the question. Should it be thought

[1] And in spatial relations as well if the implications of contemporary astrophysics are to be accepted.

that our appeals to inspection here are false, our subsequent discussion merely becomes less applicable and so less relevant.

Now let us try to determine what the rest of our question means, and how it is related to the usage of the words "the Universe" we have decided to adopt.

When we ask this sort of question "when did something or other begin?" we usually ask it in the following sort of context. You are intrigued, say, at the monstrosity of a motor car I am driving, and you exclaim "Great Scott! How old is that object?" This is obviously translatable into "When did that car begin its life as a car?" So stated, it appears to be of the same sort as the question about the beginning of the Universe. It is essential to note that this is not the case.

When you ask the question about my car, you are asking for information about a very small selection of the events that go to make up the Universe. And the information you want is the date at which certain pre-existing continuants, constructible out of these events, first became of such a character that we were justified in calling the resultant continuant a motor car. That is, we are asking for the date at which the event happened that begins the life history of a continuant within the Universe.

This requires a little elaboration. In the first place, when we ask for a date in this straightforward sense, we are asking, very shortly put, for the temporal relation that an event or set of events has to another event or set of events taken as a standard of reference. Whether this is *all* that we mean by "time" or by "dating an event" is irrelevant. That it is part and the essential part of what is meant is obvious. An event can only be dated in relation to other events, never by itself.[1] In the second place when we ask for the event that "begins" the life history of a continuant within the Universe, we are asking to be told the duration at whose early boundary events of the sort in question first happened. The word "boundary" here is merely being used to refer to the following commonplace sort of fact. Consider, for example, the duration between the beginnings of two different and successive peals of a bell; and divide it in two parts. This line of division is a boundary between the earlier and the later parts of the duration.[2]

[1] It is no doubt impossible to date an event without also placing it, and vice versa. We note this complication merely to ignore it, as it does not appear to be incompatible with the argument in the text.

[2] The observant reader will note that we are not using the Method of Extensive Abstraction at this point. We do not do so because (i) it is far above the level of the commonsensical; (ii) it appears to presuppose the notion of extents, whether surfaces, volumes or durations, and therefore the notion of boundaries.

Now contrast this usual, straightforward sort of question with the question about the beginning of the Universe.[1]

(1) Here we are not concerned with continuants or events *within* the Universe. We are concerned with the continuant that contains all events whatsoever as phases in its life history. Hence, we are not concerned to ask when certain changes in a series of events become of such a character that the Universe as a collective whole came into being. For these hypothetical pre-existing events are part of the Universe at the time they happened.

(2) From all this it follows that we have to date the beginning of the Universe as a whole in an odd way. We cannot date it by reference to a time series that is supposed to "subsist before" the beginning. For this supposition is obviously nonsensical. Temporal predicates are inapplicable when we have abstracted by definition from all events.[2]

So it seems that we have to date the beginning by reference to some temporal frame "within" the Universe. This means that we are really saying how old the Universe is. And we do this by taking some convenient unit of measurement, say, a year, and by relating some contemporary event to the event in question, viz. the beginning. In this way we can say that it began at the early boundary of n years ago, whatever n may stand for.[3]

Let us, however, note two further points about this conclusion.

(*a*) It does not amount to very much. If the Universe be dated in this way, all that we shall have done is this. We shall have compared the life history of the Universe as a whole to the life history of some part of it in respect of the indefinable relation of temporal distance and by adopting some convenient unit of measurement, we shall have expressed this comparison in numerical terms. Further, as the life history of the Universe appears to be very long on any view, it will mean very little to be told that its age is, say, five hundred and forty-nine trillion years. We know from experience

[1] In what follows it will be obvious that we are adopting the commonsensical assumption that there is one uni-dimensional time series, or "absolute process," by reference to which all events can be dated. If the complications connected with this are to be met, the argument has, no doubt, to be restated into something much more sophisticated.

[2] It is interesting to inquire whether or not this nonsensical supposition is entailed by one of the most famous answers to our question, viz. the one contained in Genesis. *Prima facie*, it *does* appear to be entailed because of the analogy between God and an individual craftsman making something.

[3] Should Uncle Tom ask "*where* did the Universe come from?" as I once heard "a plain man" ask Mr. Russell at a public meeting, the answer is that in any straightforward sense of the word "where" the "question" cannot be answered, as it is not a question, but a collection of noises. This should be obvious by analogy from the argument in the text. It is misleading to answer "Nowhere," as Mr. Russell did on that occasion.

what a period of a year is like. Most of us know from experience what ten years is like. Most of us can imagine, no doubt, what a hundred years is like. But it seems obviously beyond us to imagine what a million years is like, let alone five hundred and forty-nine trillion. So even if Uncle Tom be eventually and quite correctly informed that this is the age of the Universe, he will be unable to relate this information to anything in his experience and will remain unable to appreciate what it means. But let this point pass.

(*b*) The important thing to note is the following. As it is nonsense to suppose that temporal relations can relate anything other than events, it follows that the duration at whose early boundary the beginning of the Universe is placed is also the duration at whose early boundary the time series itself began. Let us suppose for the present without any discussion that, odd as it may sound, this implication is quite significant.

(3) A final point of difference. It is taken for granted that the origin of my monstrosity of a car is causally determined. But it is difficult to see how the beginning of the Universe can be. For it is difficult to conceive of the causal relation relating particulars other than events. Events simultaneous with the beginning are precluded as causal determinants, since they are, by definition, included in the life history of the Universe, and so themselves require causal explanation. Hence, the required events must precede the beginning. It is clear by now that this is an impossibility. If, therefore, the Universe is to begin at all, its beginning must be uncaused. It is possible no doubt, to use the words "causally determine" in some odd sense that will avoid this consequence. But the odder the usage, the more difficult does it become to use it to provide an answer that will satisfy the plain man.

Finally, an important point of similarity between the two questions. Both involve the fallacy of many questions. For they both presuppose that the continuants began, in the respective senses defined, and they then ask for the date of this beginning.

So much then for the meaning of the question. We are asking for the date in the sense explained at which the unique continuant called the Universe began its uncaused life history. And this date marks the beginning of the time series itself.

But is it a significant question?[1] The answer appears to be in

[1] It is fashionable at this point to ask the following further query. Is the question about the beginning of the Universe merely one about the use of language? or does it purport to be about empirical matters of fact? If it is the latter, are there any observational steps that can in principle be taken to answer it? See, for example, Ayer, *Language, Truth and Logic*. We do not propose to use this fashionable technique. For it has to be applied at a level far too far above that of common sense, and, in consequence, is much more

the negative. For, as we have just noted, the question presupposes that the Universe did begin, and this presupposition seems to be nonsensical.

Before we can show how this is the case, we have to draw a preliminary distinction. Let us suppose that the series of events forming the life history of the Universe occupies *n* years in the sense explained. Uncle Tom would probably agree without much hesitation that *n* must be either finite or infinite. What now does he mean by this distinction?[1] He would probably say that all numbers like 1, 2, 1001, 1392569 are finite. On reflection he would, no doubt, agree that the total number of all such numbers was infinite, and that such a collection was an instance of an infinite collection of elements. He would say this because it is clear that, while it is logically possible to count up to, say, 1001, it is not possible to count up to the total number of all such numbers. For in the series 1, 2 . . . 1001 . . . 2345678 . . ., there will always by definition be other numbers that we have not reached. Mathematicians assure us that the total number of all such numbers and the total number of members in all classes with similar defining properties is in fact the smallest of the infinite cardinal numbers. They have given it the name of Aleph nought ($\aleph_0$).

We can make this analysis of the distinction between finite and infinite a little more precise as follows. Finite numbers are those that it is logically possible to reach by successive additions of 1 starting from 0. These are what mathematicians call the inductive numbers. For they obey the Principle of Mathematical Induction, which, for our purpose, can be taken as the equivalent of the definition of finite numbers just given. Infinite numbers are those that it is *not* logically possible to reach through successive addition, and so are non-inductive.

It is important to note what the concept of an infinite class involves. To begin with, it is self evident that an infinite number, say, the number of all the inductive numbers, can have no immediate predecessor or successor, in anything like the same sense that 6 is the immediate predecessor of 7, and 8 its immediate successor. Further, it is also self evident that an infinite number is unaffected by a number of operations that are usually regarded as affecting the size of any number. Thus, it is not affected by adding or subtracting 1, 100, or any finite number; or by doubling or halving it.

likely to confuse than to enlighten Uncle Tom. Moreover, the analysis of significance presupposed is still *sub judice*. Hence, it is better for our purposes to tackle Uncle Tom's question with presuppositions that are likely to command a wider measure of agreement. This is what we propose to do.

[1] The knowledgeable reader will notice that in what follows we are merely offering in a crude way the analysis that Mr. Russell has given us. It is sufficient for our commonsensical purposes.

So that where n is infinite $n = n + 1 = n - 1 = 2n = \frac{1}{2}n$. This odd property has been given the name of "reflexiveness." Stated generally, it is the property of a class when the whole of it has the same number of members as some part of the whole. This apparent self contradiction can be "explained" as follows. Consider, for example, the infinite collection consisting in the whole numbers 1, 169, 2345, etc. Arrange them in serial form starting from 1. Now select the odd numbers. It is clear that these constitute only a part of the whole. But it is also clear that they can be placed in a one-one relation to the members of the whole, 1 in relation to 1, 3 in relation to 2, and so on. Now when we say that two classes have the same number of members we mean just that it is possible to place the members of the one in a one-one relation to the members of the other. Hence, the part in this instance has the same number of members as the whole. In cases of this sort, the whole is said to be reflected into a part of itself. So if a class is infinite, it follows that it is also reflexive.[1]

This, then, is what we mean when we say that the n years occupied by the life history of the Universe is either finite or infinite. And it follows from all this that the disjunction is exhaustive. Its history must be either finite or infinite, since there is nothing else it can be. So that, if it began at all, it must have begun a finite or an infinite time ago.

We can now proceed to show how it is nonsense to suppose that it ever began at all. Let us take the latter alternative first. If the Universe began an infinite number of, say, years ago, the series constituted by these years forms a progression of the same structure as the progression formed by, say, the series of whole numbers starting from 1. Hence, the two classes determined by the two series have the same defining properties. The number of members in the latter series is infinite, namely Aleph nought. So the number of members in the former is also Aleph nought. Now if the beginning is an infinite time ago, we shall have to say that the first yearly duration was Aleph nought years ago. But this is nonsense, as we are really asserting two incompatible things: on the one hand that there is in fact one particular duration Aleph nought years ago and that on the other hand because it is Aleph nought years ago, it cannot be a distinguishable duration. For when we say that the total number of the finite whole numbers is Aleph nought, we are not saying that there is one distinguishable whole number Aleph nought. What we are saying is that the class of all finite whole numbers possesses certain properties that define it, and we use the

[1] The sense in which it "follows" will be settled when the relation between "non inductiveness" and "reflexiveness" is determined. It need not bother us here.

symbols "Aleph nought ($\aleph_0$)" as the name for this class and for all those classes with the same certain defining properties. The same is true of the duration Aleph nought years ago. Were this not the case, we should be saying that Aleph nought is really a finite whole number, and the class constituted by these durations is a finite one. Hence, the alternative that the Universe began an infinite time ago is self contradictory and so nonsensical.

This self-contradiction may be avoidable, though at the moment it is difficult to see how it can be done. It is worth while, however, noting certain points, in order to appreciate what has to be done if it is to be done at all.

It seems clear that a beginning in any relevant sense entails that the history of the Universe is bounded or closed at the early end. Now there are two relevant ways in which a series can be bounded or closed. It can be closed by a boundary which is also a member of the series; or it can be closed by one that is not. Thus, the boundary of the series consisting in the points in the straight line AB starting from A is also a point, viz. B. But the series of proper fractions less than 1, arranged in order of decreasing magnitude, has 0 as its boundary, though it is not itself a member of the series. Let us call the former sort of boundary a "terminus" and the latter sort a "limit." Now the self contradiction in "a beginning an infinite time ago" obviously arises from the fact that while the beginning has been defined as a terminus, it actually happens at the boundary of a series with the same structure as the series of whole numbers starting from 1, and hence must be a limit. So to avoid the difficulty we can try to show one of two things. We can try to show that the suggested analysis of the series of durations that have elapsed is mistaken, in that, though infinite, it is bounded by a terminus and not a limit. In other words, we can try to show that it is a series with the logical properties, say, of the series of points on a straight line, rather than, say, the series of whole numbers. Or, we can stick to the suggested analysis of the time series, and try to offer a definition of "beginning" that makes it a limit. Neither of these alternatives appears very hopeful. Possibly the latter is preferable. The obstacle is that the new definition must at the same time be a beginning closely analogous to the sort of beginning already defined. Otherwise, Uncle Tom is likely to repudiate it as failing to state the presupposition of the question he asked. And obviously it is no good escaping the self contradiction if we can only do so by failing to ask and answer the question the plain man originally raised.

Now take the alternative form of the presupposition that the Universe began, viz. that it began a finite time ago. We have shown that the beginning of the Universe is also the beginning of the time series. But if pressed the plain man would also claim to know

that given any duration, say, the year 1910, it is not only always significant to talk about the duration of the same length that is its immediate temporal predecessor but also that this duration has in fact happened. That is, Uncle Tom would claim to know that, given any duration, say, a year n finite years ago, the duration $n + 1$ years ago has also elapsed. From this it follows that the durations, say, yearly, that go to make up the life history of the Universe form a series of the same logical structure as the series of whole numbers starting from 1. But this means that the total number of all such durations is infinite.

Even by itself this is an awkward conclusion. It means that any answer of this sort we give to the question is bound to be incompatible with something else we claim to know to be true. But there is worse to come. What is the evidential basis of the plain man's implicit claim to know that the time series is infinite? He appears to hold it with a certainty that makes experiential derivation insufficient. To say that it is *a priori* yet synthetic is to make the situation worse confounded. So we seem driven to say that it is analytic. Just as the Principle of Mathematical Induction is analytic, in that it is part of what we mean by a finite number, so part of what we mean by a duration is that, given any one that has elapsed, it can be reached by successive steps and has an immediate temporal predecessor. This entails that the total number of all such durations is infinite. And this entails that it is a self contradiction to suppose that the time series began a finite time ago. Hence, it is also a self-contradiction to suppose that the Universe did so.

The two most likely ways in which this conclusion can be avoided appear to be as follows.

(*a*) We can go back and deny that the beginning of the Universe entails that the time series should also begin at that point. The easiest way, no doubt, to do this is to offer a different analysis of time. For example, we can try to discover a relevant usage that makes temporal predicates significant in abstraction from all events.

(*b*) The more fruitful alternative to take to avoid the contradiction appears to be this. All that the plain man's usage of "duration" entails is the logical possibility of an infinitely regressive time series. It is a mistake to suppose that it entails that this possibility is actualised. He does not really claim to know that it is. He merely believes it, and this belief is obviously synthetic and *a posteriori*. So the notion of a first duration is not a self contradiction.

Two comments seem to be appropriate here.

(i) No doubt the fact of the matter is that the plain man has no one usage of the word "duration." He appears to employ, at the least, the two usages we have distinguished. All we can do in attempting to determine whether or not the question Uncle Tom

asked is significant is to adopt the one that seems the more relevant. Now, odd as it may sound, it is not at all obvious that the weaker usage, that is, the one that only entails the logical possibility of an infinitely regressive time series, is more relevant than the stronger, which is the one we chose to adopt. For the sort of answer Uncle Tom wants is the same as the one he wants to "How old is your car?" And here he obviously claims to know that the year 1909 has elapsed, as well as the one before that, and so on. He adopts this usage of "duration" here because this question functions as a preliminary to others, like "What make is it?" which involve the "presubsistence" of a time series. The chief reason, no doubt, why he does not realise that this usage precludes a first duration is that he is tempted, when considering the Universe as a whole, to abstract the time series from events in order to extend the analogy between the Universe as a whole and some continuant within it as far as possible. Hence, the greater relevance of the usage in which he claims to know that the time series is in fact infinitely regressive.

(ii) Should all this be denied, however, and the weaker usage adopted, it is worth while noting that a finite beginning will not yield Uncle Tom much satisfaction. For he obviously wants to know when the Universe began in order to be able to go on to ask "Who or what caused it to begin?" But as we have seen, there can be no preceding event to do the work. And as part of what he means by a causal relation is, roughly speaking, one whose relata are events, it is not much help to introduce determination by a timeless particular, like God. For he is then landed into the frightful difficulty of explaining how God can function as a relatum in a causal relation. By the time he has redefined his terms so as to make sense out of this, it is quite on the cards, as we have already pointed out, that it will no longer be the sort of answer he wants. Consequently, on this usage of "duration," the notion of a first duration, although not self contradictory, will remain inexplicable in precisely the sense in which Uncle Tom wants it made explicable.

But if the weaker usage of "duration" still be preferred, our discussion of Uncle Tom's question merely becomes uninteresting in this respect.

So the presupposition of the question "When did the Universe begin?" appears to be nonsensical. It is very difficult if not impossible to make the sentence "The Universe began" relevantly significant. Hence, the question itself is nonsense. This is the conclusion we seem forced to come to about it.

But still worse is to come. For it may be suggested at this point that what Uncle Tom really wanted to know was whether or not the Universe did begin. This question, it may be argued, is not nonsensical. The result of the foregoing analysis is merely to show

that all affirmative answers to it are nonsense. This still leaves it open to us to say that the Universe never began at all, which is equivalent to saying that its life history is infinite. So the question is significant, and, as this answer is the only one that is logically possible, it follows that it is true.

It is very doubtful, however, whether Uncle Tom's original question can be salvaged by this restatement. The difficulty is exhibited in the feeling of "fishiness" Uncle Tom has about the concept of an infinite collection. We can indicate the sources of this fishy feeling in the following way.[1]

When we say, for example, that "This patch is white" we are predicating a quality of a logical subject. When we say, for example, that "1938 was the twentieth anniversary of the close of the Great War," we are saying that a certain logical subject stands in a special relation to another. To the sort of something that is a logical subject philosophers have usually given the name of "substance" or "particular."[2] There is nothing queer about this concept, however difficult it may be to analyse correctly. It is merely correlative to the concepts of "quality" and "relation." For it is not possible for one to understand what is meant by a quality and a relation, unless one also understands what is meant by a particular, and conversely. And this is simply another way of saying that, if qualities and relations are to function at all in propositions, they must function as qualifying and relating particulars.

Now when we assert that the life history of the Universe is infinitely long, what we are really saying is this. If we take any unit you like as a duration, say, a year, or a million years, the history of the Universe is formed out of the series with these durations as its members. And the collection of all of them is such that it is not logically possible to count the total in the sense already explained. Now it follows from our definition of a particular that this collection is a collection of particulars.

It is here that the difficulty arises. Take the compound proposition "This is white, and that is black." "This" names one particular, and "that" names another. So part of what we mean when we say "This is white and that is black" is that this and that are numerically distinct. And this is so just because "this" names one particular, and "that" names another. Hence, part of what we mean by a

[1] It is with much hesitation that we venture into this thorny and complex field. We shall try, however, to keep as much as possible to the level of analysis adopted so far, and to put up with the consequent sacrifice of precision.

[2] There is not much to choose between these two names. The latter is perhaps preferable, in spite of its own difficulties. For the word "substance" usually arouses confusing images of things like plum puddings, pots and pans. This is confusing because it is often the case that something is a substance though not a continuant.

particular is that it is numerically distinct from any other particular, and that together with any other particular it helps to form a collection with two members. In other words, we mean that it is logically possible to name all the members in this collection. This result can obviously be generalised for any collection of particulars. To be such a collection entails that each member is numerically distinct from every other, and that it is logically possible to name all the members with, say, the logically proper names "This, that, thet, thot, thit . . . th-t." Obviously this series of names can be placed in a one-one relation with the series of the number names of the finite whole numbers. Hence, the number of the last named particular, and so the total membership, of any collection of particulars must be finite. Yet, the assertion that the life history of the Universe is infinite is just the assertion that this collection of elapsed durations though a collection of particulars, is infinite in number. Therefore, the answer to Uncle Tom's restated question is a self contradiction, and so nonsensical.

It is probably this implicit self contradiction that makes the plain man think there is something fishy about the concept of an infinite collection. Some mathematicians, however, are only too likely to deny its existence. The difficulties the plain man finds in the concept are ascribed to lack of imagination, and to the mistake of treating infinite collections as though they were finite. We do not propose to venture any further into this learned controversy. What we have said should be sufficient to show that this attitude is far too facile. There is a real difficulty here, and one that some mathematicians tend to ignore or fail to appreciate. Their behaviour is, of course, quite understandable. When we talk of the infinite number of years in the history of the Universe, we are talking about particulars that are "existent." When, however, the mathematician talks, e.g. about the number of all the finite numbers, he is talking about particulars that "do not exist," but "subsist." It is quite unnecessary that the members of the classes he is talking about should "exist" at all. The difficulty that hits one in the eye over an infinite number of "existents" does not strike one so forcibly over a similar collection of "subsistents." Moreover, all we were really concerned to show was that infinite collections of "existent" particulars are self contradictory. The difficulty may not only be less striking, but it may be avoidable altogether for infinite collections of "subsistent" particulars. For "subsistents" may be shown to differ from "existents" in some relevant respect. Whether this has been, or can be done, we do not profess to say.[1] The fact that there

[1] The plain man may be able to extract some comfort from the fact that the mathematicians are still quarrelling quite vigorously over the nature of infinite numbers. For a short survey and further references see Max Black, *The Nature of Mathematics*.

is this unique character about the sort of class the mathematician is concerned with helps to make him indifferent to the philosopher's problem. Then again, mathematicians handle the concept of the infinite so frequently and with such fruitful results that it strikes them as sheer impertinence for the philosopher to cast any aspersions on their activities. In this mood they find it difficult to give careful consideration to the philosopher's contentions. They tend, in particular, to overlook the fact that they can handle the infinite easily and fruitfully largely because they abstract from the extensional aspect of infinite classes, and examine the consequences of their defining properties alone. In other words, they abstract from the very properties of classes that according to the philosopher help to give rise to the contradictions in question. All these factors together are probably sufficient to account for the attitude of certain mathematicians to the problem.

But can this self contradiction be avoided? It is very difficult to see how it can be done at present. The Kantian distinction between "appearance" and the "thing in itself" is generally and no doubt quite rightly regarded with grave suspicion.[1] The Hegelian "true or veritable infinite" appears to be the product of verbal confusions, and is unhelpful in consequence.[2] And as we have just noted, the analysis offered by the mathematical philosophers, even if it succeeds in solving the problem for infinite numbers, which is doubtful, does not solve but merely avoids the real problem facing us. It is also difficult to be sanguine about the future. The problems of the infinite have been known for centuries, and the best brains of the time have almost invariably given some thought to them. Yet, if the above argument is correct, we have not advanced much beyond the days of Zeno. Still, we have made *some* advance, and that very recently. In mathematics the notions of the finite and the infinite have only very recently been rigorously analysed and made much more precise. On the philosophical side, it is only a short while ago that philosophers got down to a thorough analysis of the notion of particularity, as the result of which our insight into the concept has enormously increased. And so far there have been few who have expressly set themselves the task of overcoming the contradiction. The chief reason for this neglect appears to be the existing divorce between mathematical and philosophical analysis. It is only when the concerted attention of a large number of persons thoroughly equipped in both these departments is directed on to the difficulty that it may be overcome.

So all logically possible answers to the question "Did the Universe begin or not?" are nonsensical. Hence, it itself is also nonsensical.

[1] Kant, *Critique of Pure Reason*, the chapter on The Antinomy of Pure Reason.

[2] See, for example, Hegel, *Science of Logic*, vol. i, bk. i, sect. 1, chap. ii.

And we cannot salvage anything from Uncle Tom's original question.

No doubt it can be given *some* interpretation that makes it sense.[1] But this can very probably only be done at a sophisticated level far above that of common sense. And, what is much more important, it will then probably cease to remain the original question, as no answer to the reinterpreted version will be the sort of answer Uncle Tom really wants.[2]

It seems evident that several causes contribute to make the plain man ask his original question about the beginning of the Universe. One is the confusion we have already indicated between this and verbally similar questions about my car, coat, and dog. Another is the need for mental and emotional equilibrium which many plain people try to satisfy by means of beliefs and behaviour that presuppose the significance of this question about the Universe. The attempt to satisfy their need in this way leads them to ignore the logical differences between this question and others verbally similar to it; and makes them indulge in wish fulfilment thinking. Then, again, this sort of attempt and this type of thinking appears to be encouraged, albeit unwittingly in most cases, by vast vested interests all over the world. Moreover, the counteracting influence of logical analysis is for the most part prevented from operating by the education for muddle-headedness that most plain men receive.

So the mystery attached to the beginning of the Universe is really no mystery at all. It is just a self contradictory concept. The plain man is led to feel that there is some mystery about it, and so to ask the question he does chiefly through the causal factors mentioned. When he realises this the feeling of mystery disappears, and he no longer asks it.

Yet he is likely to be surprised at the general result we have reached. In the first place, he was probably not aware that he stood in need of a course of philosophical psycho-analysis, and that the factors making him ask his original question merely misled him about the nature of the world. In the second place, he no doubt tended to assume quite unthinkingly that all sentences of question form are significant. The obvious falsity of this assumption is obscured by the simple fact that the questions asked by plain men in everyday life are almost invariably answerable in principle. It is only children and logicians who ever ask "Is Saturday blue?"

Now, if our Uncle Tom is an ordinary sort of plain man, he will probably return at this stage, if he has not already done so long ago,

[1] As we have indicated all along. See, for example, pp. 293 and 294.

[2] It is this sort of *tour de force*, coupled with the assumption in public of the identity of the two questions, that provoked Bradley's celebrated attack, *Appearance and Reality*, chap. xxvii.

to the consideration of the mundane affairs of life. If, however, he is not an ordinary specimen, and is subject to the philosopher's itch, he is quite likely to go on asking questions. But they won't be the questions he started with, and he won't consider them in a state of mysterious bewilderment. They will be the questions we merely raised and then ignored in the course of "dissolving" the mystery we chose to examine. In other words, they will be typical examples of the unsettled, sophisticated issues of philosophical analysis. And he will consider them in a state of intellectual restlessness and irritation. His philosophising will consist in an attempt to rid himself of the "mental indigestion" they inflict upon him.

Now it seems possible, *prima facie*, that the sort of answer we have provided to Uncle Tom's question about the beginning of the Universe can also be provided to the other questions he persistently raises about the mystery of existence. In general, this type of answer boils down to showing that the solution to the mystery of existence is that there is no mystery. The feeling of mystery arises from certain misunderstandings about the world we live in, misunderstandings generated by causal factors similar to those already mentioned. Clearly, however, this is only a suggestion. It has to be worked out in detail for all these other questions before its worth can be adequately assessed. The answer we have worked out about the beginning of the Universe is merely an illustration of the sort of thing that can be done.

But whatever be the difficulties in the way of this type of answer, it has an undoubted advantage over the traditional sort. It conforms very much better to the "toughminded" climate of a secular age. And this is very important. The plain man's "natural disposition to metaphysics" used to be satisfied by the popular philosophy of organised religion. To-day this need is unsatisfied. And this deficiency, this "need for a present philosophy" contributes, though only in a small measure, to the instability of contemporary society. For it means that the plain man in critical situations is apt to act in an alarmingly irrational way. At the same time, he is left a prey to the political demagogue with a philosophic creed of unbelievable crudity and stupidity. The consequent uncritical and intolerant acceptance of new dogmas augurs ill for the prospect of preserving and extending democratic institutions. Hence, the necessity of approaching the plain man with answers that conform to the climate of the times. In this way alone will his attention be captured and maintained. Then we can proceed to satisfy his natural disposition to metaphysics by showing him that it is a mistake. To do this adequately we shall obviously have to develop in him as much as possible the power of critical reflection, and the capacity of distinguishing the evidentially relevant and irrelevant.

This appears to be the social task of philosophical analysis. But though we can lay it down with ease, we cannot be hopeful of much success. For the attempt to perform it will be hampered throughout by certain inimical economic and political factors. A concurrent attack has to be launched against them. To this attack it is the business of the philosophical analyst to lend his support.

DISCUSSIONS

I

SIR ARTHUR EDDINGTON'S *THE PHILOSOPHY OF PHYSICAL SCIENCE*[1]

THIS book contains the Tarner Lectures on the philosophy of science delivered by Sir Arthur Eddington in Trinity College, Cambridge, last year. It is a work which should be of great interest to philosophers, and the Editor of *Philosophy* has asked me to give a fairly full account of it, which I shall now proceed to do.

According to Eddington there is something that may properly be called "the philosophy of science," as distinct from the philosophies of various scientists. It is the philosophical position which is implicit in the procedure of contemporary physicists, and it can be elicited by reflecting on that procedure. This philosophy may be called "Subjective Selectivism" or "Structuralism," according to which of its two interconnected aspects one happens to be stressing.

We may start with some definitions. "Physical Knowledge" may be defined as cognition acquired by the methods of physical science up to date, and generally accepted as valid by experts. It is to include much that is not absolutely certain, but nothing which has not a very considerable degree of probability. Now every item of physical knowledge is an assertion of what has been or would be the result of carrying out a specified observational procedure. A large part of it consists of conditional propositions about what *would* be observed if certain things were done which in fact never have been and never will be done because of insuperable practical difficulties. Thus the statement that the moon is 240,000 miles from the earth *means* (roughly speaking) that, if a yard-stick were repeatedly laid down on a line from the earth to the moon, it would have to be laid down 240,000 × 1,760 times on end in order to reach the latter. But this experimental procedure cannot be carried out, and the evidence for the statement is a combination of the results of a quite different experimental procedure together with generalizations made from other experimental results.

The set of propositions which form the content of physical knowledge are taken as constituting the description of a world, or universe, or system; just as the propositions which form the content of *The Pickwick Papers* constitute the description of an institution called "the Pickwick Club." In neither case need we raise questions about whether, or in what sense, the object which these propositions are taken to describe "exists." Eddington asserts that it is "in accordance with a supposed necessity of thought" that physical knowledge is formulated as the description of a universe. He defines "the Physical Universe" as that of which the contents of physical knowledge constitute a description.

Now it is an essential part of Eddington's doctrine that many important physical propositions, which have been thought to record purely objective

[1] *The Philosophy of Physical Science* (Tarner Lectures, 1938). By Sir Arthur Eddington. Cambridge, at the University Press, 1939. Pp. ix + 230. Price 8s. 6d.)

facts independent of any observer, really correspond to certain features in the sensory or intellectual equipment of human beings. It would follow that the Physical Universe, as defined by him, is in part subjective. Eddington does not consider that this is any serious objection to his use of terms; but, if anyone takes complete objectivity to be part of the meaning of the phrase "Physical Universe," he can substitute the phrase "the World of Physics" for what Eddington calls "the Physical Universe." Eddington himself uses the two as synonymous.

Laws of Nature are at once generalizations and systematizations of what has actually been observed. They are generalizations because they state what *would be* observed under assignable conditions, which may never be fulfilled, as well as what *has* been observed under conditions that were in fact fulfilled. It is only because some laws are generalizations that any laws can be systematizations of actually observed facts. Physical knowledge includes knowledge of particular facts, though the physicist (as distinct, e.g., from the astronomer) is interested in them only as evidence for or illustrations of general laws.

We can now pass to the notion of Subjective Selectivism. Eddington holds that the fact that all physical propositions state what would be observed if certain assignable experimental procedures were carried out necessarily introduces a subjective element into physical knowledge. For it involves an essential reference to the sensory and intellectual equipment of human observers. Many people would be inclined to admit this in the abstract, but Eddington goes much further. From a detailed consideration of this equipment he claims to be able to deduce certain physical laws and to evaluate certain physical constants. He admits, of course, that most of these laws were in fact discovered, and most of these constants were in fact evaluated, from the results of special experiments of a highly complicated kind. He illustrates this situation by the following analogy. Suppose that a person always fished with nets of a certain minimum mesh. If he examined his catches, he would find that none of the fish that he had caught were smaller than a certain size. He might proceed to generalize this into a law about the dimensions of fish. But, if he had noticed the fact about the mesh of his fishing-nets, he could have deduced the result independently, and he could have seen that the generalization ought to take the form "No fish *that I can catch* will ever be smaller than such and such a length."

Eddington expresses this doctrine by saying that some of the laws of nature are "of epistemological origin." A law, governing the results of experiments of a given kind, is of epistemological origin if it can be inferred from the mere fact that the procedure to be followed in making such experiments is of a certain specified kind. Laws of this sort have an altogether different certainty from those which are reached by inductive generalization of experimental results. There can be no exceptions to them. The worst that can happen is that there may be situations in which the specified experimental conditions cannot be fulfilled, and so the law which would follow from the supposition that they have been is inapplicable to the observations. In the case of epistemologically derivable laws Eddington allows only a negative use to experimental tests. It is worth while to do experiments to check the results which you have deduced from your epistemological premisses, because, if the experimental result conflicts with your inference, it will show either that you have made a mistake in your reasoning or that you have overlooked or misunderstood something in the specified experimental procedure from which you argued. It is quite easy to commit one or other of these mistakes.

We can now pass from these generalities to what Eddington regards as

concrete instances. He begins with certain examples which, he admits, do not seem *prima facie* to fit in very well with the analogy of the fish and the net. These examples all consist of certain pseudo-concepts of the following kind. In each case a phrase, e.g. "simultaneity of two physical events in remote places," was current, which *seemed* intelligible because it was grammatical and was similar in form to certain other phrases, e.g. "simultaneity of a flash and a bang in my experience," which really *were* intelligible. Further reflection, however, showed that this phrase was in fact meaningless; for it was found impossible to conceive any consistent experimental procedure which should be a criterion for deciding where it did and where it did not apply. Now, Eddington says, there are two ways of dealing with such pseudo-concepts. One would be to reformulate physical propositions in such a way that no pseudo-concepts or symbols for them were involved. Another is to allow such symbols to remain, but to arrange that the truth or falsity of every proposition which contains such a symbol shall be completely independent of the numerical value which may be assigned to it. The latter is the method generally adopted in mathematical physics. Now this condition of "invariance" with respect to these pseudo-concepts imposes certain general restrictions on the form of all expressions in which they occur. These restrictions look like physical laws capable of experimental test. But in fact they are imposed by the following epistemological condition: If a physical proposition contains a symbol for something whose numerical value could not be determined by any conceivable experimental procedure, then its truth or falsity must be completely independent of any value which we may choose to assign to that symbol.

The examples of such pseudo-concepts which Eddington discusses are "the velocity of the ether relative to moving bodies," "the combination of exact velocity with exact position in the case of an ultra-atomic particle," "the directed distance between two qualitatively indistinguishable particles," and "the simultaneity of two remote events." According to him, the application of the epistemological condition just mentioned to the first and last of these pseudo-concepts gives rise to the equations of the special theory of relativity. The application of it to the third of them gives rise to the law of electrostatic attraction between electrons and protons. Plainly this is a highly technical assertion which can be appraised only by experts who are able and willing to grapple with the detailed deduction in Eddington's mathematical works.

The question now arises: What is the range of the epistemological method in modern physics? Eddington summarizes the difference between the classical and the contemporary microscopic physics as follows. The former sought for equations connecting the positions, motions, etc., of particles at one moment with their positions, motions, etc., at a later moment. The latter seeks for equations connecting an *observer's best possible estimates of* these magnitudes at one moment with *his best possible estimates* of them at a later moment. These estimates are always more or less inexact, but the range of inexactitude under given conditions can be exactly stated. It is in this way that the notion of probability enters into quantum physics. Probability is a property of beliefs, estimates, and so on; not of perfectly objective things and events. Its entry is therefore a sign that epistemological conceptions have become an essential part of the fundamental equations of sub-atomic physics. Many people have been shocked by talk of "waves of probability." Such talk ceases to upset us when we are told that the equations state how the accuracy of an observer's best possible estimates of certain magnitudes varies from moment to moment and from point to point.

Eddington thinks that the fact that some of the laws of physics are of

epistemological origin is commonly admitted by physicists; but it is admitted grudgingly, and no attempt is made to follow it up and see whether other important laws cannot be inferred in the same way *in advance of* experiment. For his own part he states his belief that " all the laws of nature that are usually classed as fundamental can be foreseen wholly from epistemological considerations. They correspond to *a priori* knowledge, and are therefore *wholly subjective.*"

This may strike the reader as "a large order," but Eddington goes further. The laws of nature contain certain numerical constants. There are four such independent constants, viz. the mass-ratio of proton and electron, the fine-structure constant, the ratio of the electrical to the gravitational force between a proton and an electron, and the ratio of the natural radius of curvature of space-time to the wave-length of a mean Schrödinger wave. These are all pure dimensionless numbers, and they have all been experimentally determined. (The first is about 1840, the second about 137; the other two are enormously great numbers, viz. $2 \cdot 3 \times 10^{39}$ and $1 \cdot 2 \times 10^{39}$ respectively.) Now Eddington claims to be able to infer these numbers from purely epistemological considerations; i.e. he claims that, not only the mathematical *form*, but also the *numerical constants*, of the fundamental laws of nature can be inferred from the mere fact that our senses and our intellects work in certain specifiable ways.

Do we know of any laws which are not of epistemological origin? Eddington's answer to this question is as follows. Since all the fundamental laws of physics are of epistemological origin, we can safely assume that, if there are any purely objective regularities in nature, they will stand in sharp contrast to the laws of physics. Now physics is by no means the whole of science. The suggestion is that the purely objective laws of nature are most likely to be found in those branches of scientific knowledge which are most remote from mathematical physics, viz. in those parts (if there be any) of biology which are not covered by bio-physics, and in those parts of psychology which are not covered by psycho-physics.

In Chapters V and VI Eddington considers in more detail the relation of epistemology to relativity theory and to quantum theory respectively. The fundamental innovation in relativity theory was to define distance and time-lapse in terms of the operations and calculations which have to be performed in order to measure them. This is specially important because these two magnitudes are involved in all other physical quantities.

In Chapter V Eddington devotes himself mainly to a discussion of length. What is needed is to specify a standard of length which shall be available for comparison at any time and place. If a vicious circle is to be avoided, the specification must not itself involve the measurement of length. In consequence of this, Eddington says, the standard must be some material structure consisting of a certain number of nuclei and electrons whose arrangement can be completely specified in terms of quantum numbers. What he has in mind is the ultra-microscopic lattice structure of some crystal of definite chemical composition.

In this connection Eddington makes the following remark. The theory of relativity is primarily a theory of *macroscopic* phenomena. But it is not self-contained, since it has to borrow its standard of length (and of duration) from ultra-microscopic physics. On the other hand, this latter theory is also not self-contained. For the physical magnitudes connected with ultra-microscopic particles must in turn be defined in terms of operations which we macroscopic beings can carry out with our macroscopic instruments. Eddington alleges that this circle is not logically vicious.

There are two further points which Eddington makes about length. (1) Ultra-microscopic structures, such as we considered in defining a standard of length, are not reproducible in strong electric or magnetic fields. The quantum specification of such a structure presupposes the absence of such fields. Yet a person may want to do experiments, which involve the measurement of length, on the effects of strong fields; e.g. to find out the curvature produced in the path of an electron when it passes through them. He will, of course, use some highly indirect method, such as taking photographs and measuring the curvature of certain lines which appear on the photographic plate. Now he can quite properly apply the standard definition of length to *these lines* and to his measurements of *them*; for they are not in a strong field. But suppose he proceeds to infer from them propositions about the paths of the *electrons* themselves. In doing so he will be applying to objects which were in a strong field a standard of length which explicitly involves the condition that the standard shall not be in such a field. It is plain that no unambiguous results can be reached in this way.

(2) The definition of distance applies directly only to very small distances. It can be applied to long distances only indirectly through summing or integrating a very large number of successive adjoined short distances. Now it is not axiomatic that such summation will lead to consistent results no matter where or when it is carried out. It turns out that the postulate that it will do so is equivalent to assuming complete absence of gravitational forces. Any departure from this condition will appear as a gravitational field, and the nature of the field will be determined by the kind and degree of departure from this condition. This, Eddington says, is the essential point of Einstein's theory of gravitation.

Chapter V concludes with an important distinction between "personal" and "generic" subjectivity. The former consists in the fact that what any individual observes is in part determined by his position and velocity and acceleration. The latter consists in the fact that the scientific knowledge which the human race acquires by sense-perception and subsequent reasoning is in part determined by the sensory and intellectual equipment common to the species. Now the first achievement of the theory of relativity was to show that *personal* subjectivity had certain subtle effects which had not hitherto been allowed for. And, by the tensor method, it does in a sense enable us to transcend this personal subjectivity by a symbolism which presents the physical world from the standpoint of every possible observer. But this leaves the *generic* subjectivity, with which Eddington is concerned in this book, untouched. It is to some extent illustrated, as we have seen, by relativity theory; it is still more clearly illustrated, in Eddington's opinion, by the fundamental part which the notion of probability plays in quantum theory.

This brings us to Chapter VI, which is concerned with epistemology and the quantum theory. I must confess that I do not find this chapter very easy to summarize. I think I can understand most of the several items in it, but I am far from clear about their precise interrelations.

We may begin with the following statements, which seem to be fundamental. The laws of contemporary physics connect "probabilities in the future" with "probabilities in the present"; those of classical physics claimed to connect "ordinary physical quantities in the future" with "ordinary physical quantities in the present." As a means of calculating future *probabilities* the laws of contemporary physics form a completely deterministic system; but, as a means of calculating future *observational knowledge* the system of law leaves a range of indeterminism open. I think that these statements are quite clear.

Next we are told that there is no possibility of reducing laws of the contemporary kind to laws of the classical kind. The ground for this assertion is that probability is not "an ordinary physical quantity." This latter assertion is supported in two ways, viz. (i) by a positive account of what "probability" means in physics, and (ii) by an attempt to show that there is a characteristically different kind of relation between (*a*) an observation and the knowledge of an ordinary physical quantity which it gives us, and (*b*) an observation and the knowledge of a probability which it gives us. These two points are treated quite separately, and I have not discovered any attempt to connect them; so I will now take them in turn.

(i) In physics the probability of an event of a given kind occurring under given conditions simply *means* the frequency with which such events are found to happen under such conditions. For physical magnitudes must be defined in terms of the procedures by which they are to be measured, and no other procedure is available for measuring probability. No further use seems to be made of this positive account of probability in the present argument.

(ii) The relation of probability to observation is said to be characterized by a peculiar irreversibility, which is not present in the relation of an ordinary physical quantity to observation. This cryptic remark is supposed to be elucidated by an example on pp. 92 to 93 about drawing balls from bags. I think that this is one of the most confused and confusing "elucidations" that I have ever met with. It is not worth while to go into detail. It will suffice to say that Eddington's statement on p. 92, "It can be deduced that the chances are 2 to 1 that the bag is A," requires the premiss (which he omits to mention) that the drawing which has been made is *equally* likely to have been from bag A or bag B. Now at the next stage of the argument on the same page he supposes that "we are handed one or other of the two bags with the information that the chances are *2 to 1*" (my italics), "that it is the bag B." So the hypothesis on which the later stage of the argument is conducted is inconsistent with the suppressed premiss from which the conclusion of the first stage was derived. It is therefore not surprising that Eddington can produce a paradox at the end of the argument. He takes this to illustrate or demonstrate the peculiar irreversibility of the relation of probability to observation; but it is surely obvious that no paradox derived by using inconsistent premisses at different stages of an argument can do anything of the kind.

I should be inclined to suppose that the fact behind all this very confusing talk is simply the following. Probability is essentially a relational term, and it is essentially relative to data. There is no more sense in talking of "the probability of p" (except as an ellipsis) than in talking of "the distance of London." The minimal intelligible statement is of the form "the probability of p relative to the datum q." Now, if the numerical value of this be given, there is no way of inferring from it the value of the probability of q relative to p as datum. Does Eddington mean anything more or anything different from this by the peculiar irreversible relation of probability to observation?

The question still remains: Why has it become necessary to formulate the laws of physics as interconnections of probabilities? Eddington's answer appears to be as follows. The conditions required for measuring any one physical magnitude with complete accuracy require the elimination of other physical magnitudes from the region under investigation at the time. But in physics we are concerned with the interrelations of various physical quantities in the same time and place. Therefore, if any empirical meaning is to be given to the laws and concepts of physics, we must consent, even in theory, to

put up with something less than complete accuracy. It is in this way that the notion of probability is introduced into the fundamental definitions.

In Chapter VIII Eddington discusses the notion of Analysis, which he considers to be a fundamental form of thought common to pre-scientific and scientific cognition. In its most general form it is the notion of a whole composed of a set of interrelated parts in accordance with some scheme of interrelation. He is careful to point out that what counts as one part of a given whole is always relative to a particular scheme of interconnection. In reference to the anatomical mode of analysis a thigh-bone is one part of a human body and a single cell is not. In reference to the physiological mode of analysis a cell is one part and a thigh-bone is not.

This general notion of analysis takes various special forms. Cf., e.g., the analysis of a body into a set of organs and the analysis of a complex wave-motion into a set of superimposed simple-harmonic components. Modern physics does not confine itself to the first and more familiar form, which allows only of *positive* parts or elements and is, Eddington thinks, bound up with the notion of substance.

Eddington holds that another form of thought, which has great influence in physics, is the persistent tendency to reduce all variety to differences of relation among intrinsically homogeneous elements. (He seems not to be acquainted with the works of M. Meyerson, or he could not have failed to mention them at this point.) He suggests that this ideal has actually been reached in the case of electrons and protons, in spite of the *prima facie* appearance to the contrary, because the difference in the mass and in the nature of the electric charge can be ascribed to a difference in the relations of intrinsically similar particles to external matter.

Another important demand of thought is that the individual elements in any scheme of analysis shall have a considerable degree of permanence. Here we have to treat microscopic and macroscopic physics separately. Eddington says that the natural time-unit for microscopic phenomena is so short in comparison with a human being's specious present that any such phenomenon must last for an immense period, as measured by that unit, if it is to be capable of entering into the field of human observation. So he has no difficulty in attributing the persistence which we seem to find in the elements of microscopic physics to subjective conditions. But we also find a great deal of persistence, which forces itself on our attention, on the macroscopic scale. We are surrounded with visibly persistent solid objects; and the law of the conservation of mass is illustrated on a large scale, both spatially and temporally, under our very noses. Eddington finds this tendency of the macroscopic world to "play up to" certain of the demands of our intellects somewhat embarrassing. He tries to account for it by arguing that we could not live if the macroscopic world, with which we have to deal in practice, did not more or less answer to our intellectual demands. This rough agreement is, he thinks, secured by the existence of our very specialized brains and nervous systems, which select and concentrate stimuli in such a way as to present us with an environment of perceptibly steady and persistent large-scale objects. (The similarity of this view to certain doctrines in M. Bergson's *Matière et Mémoire* will be obvious.)

Eddington holds that one feature in the conceptual scheme of analysis is the demand that the ultimate elements shall be existentially independent of each other. Now he holds that this demand, if pressed to the limit, would make the physical universe intrinsically unobservable and thus lead to a contradiction. He takes the concept of *interaction* to be the means by which such a contradiction is avoided; and he congratulates the quantum theory

on being able to show that "*all* interaction-forces in physics arise from the indistinguishability of the ultimate particles," so that "interaction has . . . a subjective origin." It seems to me that these statements are too condensed to be at all intelligible to non-experts. Also I think that there are several confusions in the previous argument. So far as I can see, the only kind of independence which is required in the ultimate elements of any scheme of analysis is that it should be *logically* possible for any one of them to have *existed* without the rest. There is surely no conflict between this and the supposition that the *variations in the states and the relations* of any one of them are *causally dependent* on variations in the states and relations of the rest.

Chapter IX contains an important, but difficult, account of the notion of *Structure*. It starts by explaining the mathematical notion of a "Group of Operations." A set of operations constitutes a "group," in this technical sense, if the following conditions are fulfilled. Let P and Q be any two members of the set. Suppose that the operation Q is performed on any entity x, and that then the operation P is performed on the result which has been obtained by performing Q on x. Then there is always another member R of the set, such that the result of performing R on x is the same as the result of the two successive operations mentioned in the last sentence. Thus the members of any group fall into sets of three, such as P, Q, and R. Any particular group will be specified by specifying the interrelations of such triads. This constitutes the "structure" of any set of entities to which the operations of the group could be applied. It is quite unnecessary for us to know anything about the intrinsic nature of the individual operations in a group thus specified or about the intrinsic nature of the entities to which they are applied. If you try to fill out a purely structural concept of this kind by some concrete picture of the individual entities and operations, you have what Eddington calls (surely very oddly) a "*general*" concept. I should prefer to call it a "schematized" concept. E.g., the notion of Euclidean space is a schematized concept in which the entities are supposed to be points and the operations are supposed to be certain kinds of movement by which one point can be made to coincide with another. This group of operations can be specified by its purely formal group-properties, and we can then cease to consider whether the operations are movements and the entities are points. We thus extract from the schematized concept the corresponding purely structural group-concept. Now, as mathematical physics has developed, it has ceased to be concerned with schematized concepts and has ended by dealing with nothing but pure group-structure.

Eddington uses these contentions to get rid of a dualism between events in a person's brain and the correlated sensations in his mind. So far as I can understand his doctrine, it is as follows. (1) A sensation and the brain-event which is its immediate physiological correlate are not two events standing in the relation of effect to cause. They are one and the same entity. This counts as a sensation, e.g. of sound, in respect of the peculiar sensible quality which it has for the experient; and it counts as a physical event in respect of its relations to other things and events in the physical world. (2) The logical (though not the historical) starting-point of physics is knowledge of the interrelations of an individual's contemporary sensations. This is filled out by his memories and by the reports of others about their sensations. It is further filled out by inferences based on regularities which have been discovered, under the guidance of certain intellectual habits, already described, in the directly experienced portions. (3) Physical knowledge is knowledge of the group-structures of this whole mass of interrelated actual and conditional human sensations. (4) What is called the "physical world" is just the world

described in purely physical terms. Since physical knowledge turns out to be knowledge of pure group-structure, the physical world is just the world considered as having that pure group-structure which physics ascribes to it. (5) Certain parts of the world are events in the brains of living organisms; most parts of it, so far as we know, are not. Both these parts can be described in purely physical terms. But something further can be said of the former; since we know by direct experience that they are also sensations of various kinds, interrelated in various ways of which we can be directly aware. Of the nature and interrelations of the other parts of the world we can speak with certainty *only* in physical terms, i.e. only in terms of pure group-structure. But we know that this is not *incompatible* with their intrinsic nature being sensational; and, if we insist on ascribing an intrinsic nature to them, the qualities and relations which are directly manifested to us in our own sensations are the only materials at our disposal for filling out the pure group-concept into a schematized concept.

(In the above account I have departed in certain ways from Eddington's actual use of terms. He talks of the "*external* world," where I have talked of "the world." And he speaks of the "physical world" as "the structure of the external world." I prefer not to use the phrase "external world" in this connection, because it seems to me odd to call one's own brain part of the external world. And I think it is less confusing to say that the physical world is just the world considered as having that structure which physics assigns to it than to say that the physical world is the structure of the external world. I do not think that these verbal changes in any way distort Eddington's meaning.)

Chapter X is concerned with the concept of existence. The first two sections of it are intelligible, but not, I think, of much importance. The third and fourth sections, about "idem-potent symbols" and double symbols for relations, probably refer to matters which are highly important. But they are so sketchy that they will be utterly unintelligible to almost all readers. I content myself with noting that the idem-potent symbol J has the same formal properties as what is called "truth-value" in the two-valued algebra of the propositional calculus in logic.

The earlier parts of Chapter XI are concerned with that constant of nature which is called the "Cosmical Constant" and is commonly described as the number of electrons in the universe. Eddington claims to be able to deduce this number from epistemological considerations, and says that the result of his deductions agrees pretty well with the value which has been inferred from certain experimental results. Since the number of electrons in the universe seems *prima facie* to be something typically contingent, Eddington feels that he must do something to obviate the paradox of his claim to determine it *a priori*. He does this by pointing out that the nature of an electron, on the quantum theory, is such that the notion of electrons being countable involves a contradiction. Therefore the phrase "number of electrons in the universe" cannot be interpreted in the way in which we should interpret the phrase "number of inhabitants of England in 1940." It has actually to be regarded as the maximum possible value which a certain function in quantum-theory, which can take only integral values, can have. When seen in this light the claim to deduce this number from purely epistemological considerations appears less preposterous. The extremely sketchy outline which Eddington gives of the process by which the number is deduced will, I think, be unintelligible to nearly all his readers. It is certainly so to me.

Section III of Chapter XI is concerned with the nature of teleological behaviour and its relation to the laws of physics. It is highly condensed, and

I am not at all sure that I understand it. The gist of it appears to be as follows. All the laws of physics are *a priori* and therefore apply to all matter without exception. But they do not suffice to determine completely the behaviour of any system at a later moment in terms of data available at an earlier moment. We can make the hypothesis that there is no correlation between the behaviours of the various particles of a system within the range that is left undetermined by the laws of physics. This hypothesis is fully verified by *inorganic* systems; any departure from it would lead to results which are in conflict with observation. But there is no necessity about this hypothesis of non-correlation. There is nothing to forbid us supposing that in certain systems there is a high degree of correlation between the behaviours of the various particles within the range which is left undetermined by the laws of physics. Such an hypothesis seems necessary in order to account for the characteristic behaviour of those systems which are living and intelligent. The laws of this correlation would be non-physical and not epistemologically derivable.

The last two chapters of the book, entitled *The Beginnings of Knowledge* and *The Synthesis of Knowledge*, deal directly with psychological and epistemological problems familiar to philosophers. The main points in the first three sections of Chapter XII are as follows.

(1) The primary data from which physical knowledge is derived are the sensations of which a person is directly aware at any moment of his life. Of the special sensations only those of sight are of fundamental importance to physics. But we must also include under the head of sensation the direct awareness which a person has of the passage of time. This sensation is connected with changes of entropy in some part of the brain; a state of greater entropy being felt as later than one of lesser entropy. (2) To the sensations of which a person is directly aware at any moment must be added those which he remembers having had. He is directly aware of these present memory, experiences, and he takes them as knowledge of the fact that he has had such and such sensations in the past; but he is not now directly aware of those past sensations, as he is of his present sensations. (3) Lastly, we must add further the sensations which other men tell us that they have had. Each of us postulates that his direct awareness of certain of his own present sensations (viz. those associated with listening and reading) is an indirect awareness of sensations occurring outside his own consciousness. (4) Eddington describes this last-mentioned form of cognition as "sympathetic understanding." He rejects the logical positivist view that the *meaning* of statements about other men's sensations consists in the bodily changes by observing which we should test such statements. He recognizes that no other test is available, but he holds, nevertheless, that sympathetic understanding gives us knowledge (more or less certain) of the existence and experiences of other persons. He compares the basing of knowledge of *other* persons and their experiences on *one's own* sensations to the basing of knowledge of one's own *past* experiences on one's *present* memory-experiences. (5) The minimum datum for physical knowledge is, not the occurrence of any one sensation, but the awareness that a sensation which one is now having is or is not like a certain sensation which one has had before.

The point made by Eddington in the last section of this chapter is directly linked with the topics of Chapter XII, so I will take them together.

I think that the main point which Eddington wishes to make here is that the linguistic expressions, by which a person indicates the fact that he is having an experience and tries to describe it to others, are liable to suggest by their grammatical structure an analysis which is doubtful and probably

mistaken. Take, e.g., the sentence "I am now hearing a squeaky noise." The form of the sentence suggests that a particular of one kind—an Ego—is standing in a certain relation—a species of sensing—to a particular of another kind—an auditory sensum. Take again the sentence "I know that I am hearing a squeaky noise." The form of this suggests a still more complex state of affairs. We may be led by the form of the first sentence to ask whether this very noise might not have existed unheard by me; and we may be led by the form of the second to ask whether I might not be hearing a squeaky noise without knowing that I was doing so.

I understand Eddington to hold that both these questions are nonsensical. It would generally be admitted that "to feel tired" just means to feel *tiredly*; and his suggestion appears to be that "to hear a squeaky noise" just means to feel "squeaky-noisily." Our language is rich in nouns and poor in adverbs, and that is why the latter mode of expression, which accords better in structure with the facts than the usual one, is not available. Again, it is meaningless to suggest that a person could be hearing a squeaky noise without knowing that he was doing so. Eddington thinks that the expression in which the word "I" occurs twice arises in the following way. Each of us believes that there are other persons beside himself. *You* may be hearing a squeaky noise without *my* knowing that you are doing so; and *I* may believe that *you* are hearing a squeaky noise without your hearing one. Hence the phrase "*I* know that *you* are hearing a squeaky noise" does state a different fact from the sentence "*You* are hearing a squeaky noise," if it states a fact at all. This makes it appear that the sentence "I know that I am hearing a squeaky noise" states a different fact from "I am hearing a squeaky noise." A solipsist would be under no temptation to use the more complex mode of expression.

But, although a solipsist would have no occasion to use such expressions or to talk of "my" experiences, since he would have no occasion to contrast them with any other experiences, he would have occasion to use such reflexive expressions as "I am aware of myself." By using this expression he would not, in Eddington's opinion, be meaning to contrast *his* self with any other self. He would be recognizing that he is not a mere aggregate of his various experiences. These experiences are united in a characteristic form of unity; each of us is directly aware of this form of unity as well as the several experiences; and the expression "I am aware of myself" indicates this awareness.

I have now given what I hope may be a fair and adequate summary of the main contentions in Eddington's book. I will end with a few brief comments.

(1) It is, from the nature of the case, quite impossible for anyone to form a rational opinion about the truth of Eddington's main thesis from the materials provided in this book. No one would wish to deny the possibility that some of the laws of nature, which appear to be merely inductive generalizations, are really consequences of certain facts about the sensory and intellectual equipment of human observers and the nature of experimental research and verification. But the question whether this possibility is realized, and, if so, to what extent, can be decided only by having the actual argument presented to one in each case in which it is alleged that a law can be epistemologically derived. The proofs of all such puddings are in the eating. Now the "eating" can be done only be those who are able to chew and digest the extremely tough meat of Eddington's technical mathematical writings. A peptonized form of this is presented in his previous semi-popular book *New Pathways in Science*; but, although the rather more detailed account of Group Theory given in that does help one to *understand* much that

is obscure from sheer sketchiness in the present work, it does not and could not put one in a position to estimate the validity of the arguments.

Now in many cases this would not much matter. As philosophers we might reasonably be expected to accept as valid the technical deductions of so eminent an authority as Eddington, even though we could not follow the detailed reasoning ourselves. But, unfortunately, the situation is not so comfortable here. When I ask my expert colleagues whether I can safely accept Eddington's conclusions in these matters, they always answer in the negative. But this does not satisfy me. For I am quite convinced that their unfavourable answer is not based on a first-hand study of the arguments. It is quite plain that their attitude may be summed up in the sentence: "This kind of thing *must* be wrong somewhere; but I can't be expected to waste my valuable time in finding out precisely where the mistake lies." This is exactly the same attitude as philosophers took up towards McTaggart's *Nature of Existence*. In that case the detailed examination which I undertook showed conclusively that their worst suspicions had been fully justified. It is greatly to be wished that some competent mathematical physicist, with a critical rather than a creative intellect, should undertake an "Examination of Eddington's Mathematics" comparable to my *Examination of McTaggart's Philosophy*. It is possible that, although McTaggart was ploughed, Eddington might pass with honours. But, until something of this kind has been done, philosophers will do well to be extremely cautious in either accepting or rejecting Eddington's detailed contentions.

(2) There is one elementary point to be raised about the allegation that the numerical values of the constants of nature, as distinct from the general laws of nature, can be deduced from purely epistemological considerations. No valid argument can derive a *singular* conclusion from premisses which are all *universal*. If you are to reach a particular number in your conclusion, you must have at least one premiss in which a particular number appears as a term. What is the purely epistemological premiss which contains a particular number as a term? Is it, perhaps, the fact that human spatial perception is three-dimensional, and that to locate an event completely one further bit of information is needed, viz., a date? This does introduce a premiss, which might fairly be said to be epistemological, containing the number 4 as a term in it.

(3) I do not think that there is much connection between the "selective subjectivism" and the "structuralism" of Eddington's theory. Of course both of them may be true. But the structuralism might be true and important, so far as I can see, even if the selective subjectivism were false or greatly exaggerated.

(4) Eddington mentions the affinity of his views in certain respects to those of Kant. In the course of this review I have pointed out resemblances to characteristic doctrines of M. Bergson and the late M. Meyerson. It remains for me to remark that Eddington's account of the function of experiment in connection with laws which are really of epistemological origin reminded me of Descartes's views on a similar topic. For Descartes the laws of motion were deducible from the perfection of God, whilst for Eddington they are deducible from the peculiarities of the human mind. In each case the real function of the experiments by which they were ostensibly suggested and verified must be very different from what it appears to be. For both philosophers the experiments are rather a concession to our muddle-headedness and lack of insight.

C. D. Broad.

II

HEGEL AND PRUSSIANISM

In the course of his reply, in the April issue of *Philosophy*, to my article on "Hegel and Prussianism," which appeared in the January number, Mr. Carritt says that for his general impression of Hegel's political philosophy, so far as the internal policy of the State is concerned, he relies mainly on § 258 of the *Philosophie des Rechts*. In that paragraph we are told, *inter alia*, that the State is absolutely rational; in the *Anmerkung* which follows, Hegel explains that rationality consists in the thoroughgoing unity of universal and individual, or, more concretely, in the unity of objective freedom with subjective freedom (i.e. the individual's freedom to know and will his private ends). It follows from Hegel's remarks that individual freedom and private welfare are in his view integral elements in the rational State to which he says it is the individual's highest duty to belong. (Compare the *Zusatz* to § 265, where he says that the end of the State is the happiness of the citizens, and that the State's footing is insecure if it is not the means of satisfying subjective aims.) In face, therefore, of Hegel's own exegesis of this paragraph, which Mr. Carritt regards as crucial, I find it hard to understand how he can still hold that Hegel believes the individual to be a mere means to the State's ends (see pp. 193–194 of the April issue).

To one who reads the *Philosophie des Rechts* as a whole and does not rely on isolated passages, the tenor of Hegel's view of the State is not really in doubt. He believes that the essence of the nation State is a tension between the State's power on the one side and the individual's freedom on the other. If the tension is destroyed by laying exclusive emphasis on the latter, the result is anarchy and the disappearance of the State; if by laying emphasis exclusively on the former, then the State becomes "mere might and a synonym for despotism" (§ 278). As I indicated in my article, it is open to a critic to consider Hegel's safeguards for private freedom and to maintain that they are insufficient; what perplexes me is criticism like Mr. Carritt's, which ignores these safeguards, implies that they do not exist, and consequently misses what for Hegel is the very essence of the State, namely the tension to which I have referred.

Mr. Carritt concludes his reply by summarizing an interpretation of Hegel which he claims has been current for eighty years, and to which he seems to subscribe. I should like to make some comments on his summary—a summary which I do not believe those whom he quotes would accept.

(i) "Hegel thinks that might indicates right." This is certainly an overstatement, if not actually false. Hegel believes that right is mighty, but that is not what Mr. Carritt says. If he had believed that "might indicates right" there would have been no sense in his clear distinction between brute force and the "might of the Idea" (see e.g. footnote to § 258) and his repudiation of despotism (e.g. *Anmerkung* to § 278).

(ii) "Hegel defends the suppression of free speech." Here again we have an overstatement. Hegel defended the dismissal of Fries, but he also advocated free speech and the freedom of the press (§ 319). A critic here is entitled

to say that the freedom advocated is too circumscribed, or is allowed for the wrong reasons; but I do not see why § 319, and not the remark about Fries in the Preface, is to be dismissed as an "inconsistency." This is the line which Mr. Carritt appears to take (see p. 192 of his reply); but to dismiss either of Hegel's strains of thought as an "inconsistency" is to miss the whole point of his doctrine (see above, my second paragraph).

(iii) "Hegel defends the subordination of conscience to law and tradition." This is true, but it is misleading as it stands. Hegel's doctrine is that while conscientiousness is intrinsic to concrete morality (*Sittlichkeit*), it is only its form; to be justified, it must be conviction of what is objectively right (§ 141). Conscientious conviction alone (mere *Moralität*, abstract morality) is no excuse for murder (§ 140). With the question of whether Hegel is right or wrong here, I am not at present concerned, but it would be interesting to know how many of those who, with Hegel, allow conscientious objections to military service, will go on, against him, to allow immunity and moral justification, on the strength of conscientious convictions, to conscientious murderers and sadists.

(iv) "Hegel thinks war necessary and the attempt to abolish it silly." To this assertion I raise no objections; but it is not the same as what Mr. Carritt wrote in *Morals and Politics*, and now still defends (p. 191) as a fair summary of Hegel's view. I notice, however, that in criticizing what I said in my article on this topic, he still leaves unmentioned the most crucial parts of the quotation from Hegel which I used to criticize him.

(v) "Hegel believes the State to have some other justification than the welfare of its members or the enforcement of justice." This also is true; though it would be fair to point out that Hegel believes that the State does secure both of these things incidentally, even though securing them is not its essence.

(vi) "Hegel believes the State to have no duties to other States." I do not know whether this is true or not. Hegel's statements conflict, and I am not prepared to reject either of them as an "inconsistency." He says that the State's final law is its own interest, and implies that it may override and break its obligations to other States. On the other hand, he also says that "treaties ought to be kept, that envoys ought to be respected, that war ought not to be waged against domestic institutions." and so forth, and this clearly implies that the State *has* duties to other States.

(vii) Mr. Carritt thinks that I will not suggest that Hegel ascribed any value to the "democratic principles of equality and representative government." Whether Hegel's remarks about inequality in § 200 and the special characteristics which he ascribes to the members of the Upper House (§§ 305–307) are tantamount to a rejection of the "democratic principle of equality," I do not know, and I will make no suggestion with regard to that. But I am prepared to suggest that Hegel attached great importance to representative government. A Lower House of Parliament, representative of each of the main branches of civil society, is an integral and essential part of Hegel's proposed constitution. But since it is one of his chief safeguards for private freedom I cannot feel surprise that Mr. Carritt allows it no importance.

Finally, I took exception to Mr. Carritt's attribution to Hegel of the view that "philosophy's proper exercise is in the service of the State." Mr. Carritt alludes to my criticism at some length, but he says nothing of its essence, namely my attempt to show that the words which he quotes from Hegel mean no more than that professors of philosophy in Prussia were civil servants.

T. M. Knox.

HEGEL AND PRUSSIANISM

Mr. Carritt's Reply

The Editor has allowed me to see the above in MS. and to attempt an answer in very narrow limits. As the discussion is now to be closed, let me say that I have profited by it, and now have an impression of Hegel's political theory as less consistent than before. I hope Professor Knox can return the compliment. I will take his main points briefly in order.

In *P.d.R.*, § 258, Hegel certainly says "the State" is absolutely rational. And who can question that to a State we know to be absolutely rational, just, and beneficent we owe implicit obedience? But he goes on to say that "*Every* modern State, whatever faults we may recognize in it, if it is a developed modern State, has the essential characteristics of a State," i.e. I suppose, the rationality which invariably obliges us to implicit obedience. I find this a hard doctrine about the Prussia or Britain of 1820 or to-day. The vacillation between the ideal and the actual is of course crucial for the whole discussion. In Hegel's rational State, where "subjective" and "objective freedom" are identified, the "coercive State" would have "withered away." But it is only in our own coercive States that the problems of obedience, reform, and resistance arise. I feel vague about the meaning of the word "tension" in this context. Does it imply hostility and struggle, or a harmony of balance? Anyhow it is obvious that in any actual State there must be *some* freedom (since not every detail can be prescribed), but also *some* discipline, and therefore not that complete union of subjective and objective freedom which obliges to unquestioning obedience. I dealt with § 278 in April. I agree with § 265, and wish I could make it consistent with the passages I then quoted (p. 194).

The numbering of the following points is Professor Knox's:—

(i) Agreeing that Hegel thinks right always has might, he denies that it follows that might always has right. "Mighty" is a relative term, and I cannot believe that Hegel meant that, though right has always a little might, it sometimes has less than wrong has. From the *P. d. Geschichte* (where "immoral" acts are "justified" by success) he clearly thinks that, in the fairly long run, what succeeds is always right. Or would Professor Knox say that only in "ideal States" (condemned in *P.d.R. Vorrede*, p. 18) is the idea realized?

I take the distinction between "brute force" and "the might of the Idea" to be that the might of the latter, being more "cunning," succeeds in the end.

(ii) On once more re-reading *P.d.R. Vorrede* I still think Hegel not only alludes to the fact that Prussian professors (lucky Schopenhauer!) were civil servants, but approves of that system and of the Government's action in dismissing an opposition professor and tightening an existing academic censorship. In § 319 Hegel refuses to define freedom of speech as "being allowed to say what you please," and clearly means by it "being allowed to say what you ought to be allowed," i.e. a "union of subjective and objective freedom." It is therefore easy for him to say that *this* freedom of speech ought to be, and the real question: "How much saying what you please is consistent with the freedom of other people in other respects or with their other rights?" does not arise.

(iii) I agree that conscientious convictions about military or other killing may be wrong, and that, when we are convinced they are, we may think it our duty to "punish" the resulting actions in the interest of the freedom of others. My protest is against the doctrine, which Professor Knox agrees to be Hegel's, that we always ought "to submit our conscience to law and tradition" as if the makers of these were certainly infallible and disinterested. The same claim has been as reasonably made for Church Councils (of various churches) and for the Third International, only they have less might.

(iv) Professor Knox agrees that Hegel thinks war is necessary, and the attempts to prevent it silly, and that it does not arise from injustice or passion, but may be commended as quieting internal discontent. But still he does not think my summary of the doctrine in *Morals and Politics*, p. 108, or *Philosophy*, April, p. 191, fair. I only ask that these passages should be read with his criticism in *Philosophy*, January, p. 62. The exculpatory passage I am blamed for neglecting says that wars end, grow humaner, and respect ambassadors and private persons. It needs no comment.

(v) He admits that Hegel's essential justification of the State is neither that it secures the welfare of its members, nor that it enforces justice. Yet he objects to my saying that this makes the "inconsiderable" subjects a means to the State, as seems to be admitted in the passage I quoted.

(vi) He does not know whether or not "Hegel believes the State to have no duties to other States" because Hegel's "statements conflict." Yet he does not admit these conflicting statements are inconsistent. I do not follow this.

(vii) I am not sure how far Hegel's Lower House, which seems to have a "corporative" character, is only "virtually" representative in the sense dear to Whig oligarchies, but in the *System d. Sittlichkeit*, III, iii, he thinks that the sanctity of a ruling class would be diminished if it were elected.

In view, then, of admittedly "conflicting statements," what is Hegel's fundamental teaching? Perhaps the difference between Professor Knox and myself partly depends on his exclusive use of the *P.d.R.*, while I had interpreted it by help of the *P. d. Geschichte* and *System der Sittlichkeit*. But I thought the only answer, other than a bare statement of impression, was to note the interpretations given by qualified and especially by favourable critics. Since my April article I have happened upon two more, which are significant:—

(1) Professor Vaughan, who (paradoxically enough, as I think) admires Hegel more than any other political philosopher, is yet constrained, in his *Studies in the History of Political Philosophy*, to say: "The memory of Fichte and Hegel is for ever burdened with the theory of the 'absolute state,' to which Bismarck harnessed the principle of nationality. . . . Before the 'stark congealment of blood and iron, in which their theories have resulted, even Fichte and Hegel, it may be hoped in charity, would have stood aghast' " (I 3). "Hegel, followed by a select band of English writers, identifies 'liberty' with the Prussian constitution" (268). "Fichte and Hegel . . . destroy that principle of individuality . . . without which the unity of the state sinks into a mere mechanical conformity. . . . In exposing the abuses inherent in the present distribution of property . . . they can claim no part" (II 5*). "Hegel, the theorist and idolater of Prussian bureaucracy" (96). "Nobody could be readier, when it suited his purpose . . . to assure the world that the most retrograde and oppressive institutions, being undeniably actual, must also be accepted as indisputably rational" (295). Paraphrasing *Philosophie der Geschichte*, pp. 25–33, he says: "Men's passions lie closer to them than the *artificial* and tedious discipline of self-restraint, morality and right" (289; my italics).

(2) Professor Gilson in *The Unity of Philosophical Experience* says: "(Hegel's dialectical justifications of war) are really and truly murderous ideas, and all the blood for which they are responsible has not yet been shed. Yet they are the last word of Hegelianism" (p. 252); and "When Fascism got the upper hand in Italy, Gentile's Hegelianism was fully justified in welcoming it in the name of Hegel's theory of the state. . . . By saying that the state asserts its own autonomy in war, Gentile was merely repeating what we have seen to be the authentic Hegelian conception of the state" (294).

HEGEL AND PRUSSIANISM

Professor Knox in his reply to Mr. J. A. Spender in the April number of *Philosophy* justifies his contention (in the previous number) that Hegel does not teach that success justifies immorality, as follows: "*If you like*, Hegel holds, you *may* judge that the great man is proud, immoral, heartless, and cruel, but these moral judgments are irrelevant [to what?] because they apply only to the overt [= inward?] character of the great man's deed and not at all to the substance of what he effects. For instance, Caesar's opponents had the *law and constitution* on their side, and his advance to autocracy was therefore *technically* unjust and wrong, but the foundation of the Roman Empire was an advance in civilization. Hegel further holds that at times *before constitutional law is established*, the great man has no option but to resort to force and violence, in order to establish law and order. Once a rational, i.e. a free, constitution is established, the right to use force has gone and changes must be brought about by constitutional means. Many writers have held that moral judgments are out of place in historical writing." (Italics and words in brackets are mine.)

Surely there are inconsistencies here. First we seem to be told that all Hegel meant was the stale platitude that a *bad act* may have good or felicific results. Then we are told that what he meant was that the alleged 'bad' acts were only illegal, but *morally good*. Then we hear that once law and constitutions are established, force (and therefore Caesar's force) is *wrong*. Finally we are told that the whole discussion is considered by many writers nonsensical since moral judgments are out of place in history, i.e. I suppose must not be made about the past.

But Hegel is passing moral judgments. He is maintaining that *Sittlichkeit* is superior to *Moralität*; that the action of Caesar was immoral and yet *gerecht*; that States have the *duty* to aggrandise themselves at the cost of weaker neighbours (*Philosophie des Rechts*, § 258, *Philosophie der Geschichte*, Introduction).

E. F. Carritt.

(This completes the discussion.—Ed.)

III

FASCISM AND NAZISM

Professor Collingwood appears to invite comment on his article on Fascism and Nazism in the April number. He speaks with great authority as historian as well as philosopher, and as having familiarity with modern Germany, Italy, and Spain. Yet I venture to rush in, in case others of authority comparable to his do not come forward. The subject is of such vital importance that I think his conclusions should not be accepted without discussion. The questions raised which as it seems to me do urgently demand consideration, are firstly, can any sort of beliefs, whatever their character, so long as they are enforced in a particular way, and with a special kind of emotional appeal, become a great religious inspiration? Secondly, has the faith of the Western democracies in freedom and the liberal ideal of life ceased to be such an inspiration?

To take the latter question first. With regard to Professor Collingwood's primary assumption that only peoples rich in religious energy can overcome all obstacles and attain any height in the scale of civilization, I should be in substantial agreement. The term religious energy is evidently used in a wide sense, and as I understand it, it closely corresponds with the creative force of personality, which Professor Toynbee regards as source of the origin of civilizations.[1] The part of Professor Collingwood's argument which seems at the outset to call for question is that which attributes to Christianity alone the development and endurance in Western Europe of the liberal devotion to freedom. The liberal ideal of life has never been better stated than in the fifth century B.C., by Thucydides, in his version of Pericles' speech over the Athenian fallen. Though in important respects Athens did not live up to this ideal, this does not seem to affect the fact that it was recognized, any more than do the lapses of modern liberty-loving nations from their ideals.

Professor Collingwood may *know* that the Athenian conception of the way of life in a free people had nothing to do with the gradual development of a similar conception in Christendom. Of such knowledge, however, it is very difficult to be sure, in the inconceivable complexity of the growth of ideas in the intricate web of history. But the importance of the question of the relations of these ideas does not mainly depend on the historic sources of the faith in freedom and devotion to the liberal way of life. It depends more on the evidence we can find in history, as also in common experience, and in that interpretation of life which we possess in the literature of genius, that the need for freedom, and for the expression of the free spirit in creative energy, is innately potential in the human self though seldom allowed to come to full fruition, and seldom or never able to constitute a society in complete harmony with the demands involved. As regards Professor Collingwood's view that modern politics and physical science are due to the religious passion for Christianity it is to be regretted that he does not in detail establish these very interesting and paradoxical positions, and show the relation of political and scientific principles to Christian theology. Yet it may be felt that these "rational contents of the Christian faith" were treated by original Christianity rather as things that belong to Caesar. That as Christianity ceased to be

[1] *A Study of History*, volumes i, etc.

essentially other-worldly, the explosive force of its tremendous doctrines of the equality of all men as sons of God, and the infinite value of the human soul had their effect on political forms, institutions, and laws, and last of all in some degree on economic conditions, seems beyond question.

Has then the potency of Christian ideas ceased? Is this process which is already far advanced in some countries, at least beginning in the others? Professor Collingwood points out that such power as liberal principles exercised in Italy and Germany could not survive the weakening of Christianity and substitution for it of pre-Christian paganism which had always survived unofficially in Italian Catholicism, and has in recent years been officially encouraged in Germany. Since he believes that all over the world liberal or democratic principles have been deprived of their "punch," because they are derived from Christianity, and Christianity is losing the magical elements which are necessary to its power over the emotions, the implication to which he obviously inclines is that this will happen, and indeed is beginning to happen in the principal western democratic countries.

I have argued that these liberal principles much as their development owes to Christianity have roots inherent in human personality. Where conditions are not too unfavourable—such as the struggle for life, the primitive weight of custom, the oppression of man by man—they will emerge in some form, in some measure, though this has been rare in the long ages of history. Nor does it appear to me that there is sufficient justification for Professor Collingwood's view either that the effects of "destructive forces" undermining the faith in freedom are evident in the free peoples, or that the contribution of Christianity to the strength of this faith will be lost. The signs of disillusionment to be observed in literature, art, philosophic speculation, modes of social life, seem to count for little, when we survey the substantial facts of experience which endure to-day, in spite of the unparalleled trials to mental outlook, and shocks to their faith in the conservation of values, suffered by two successive generations. In all directions of enterprise demanding self-sacrifice and the passion to transcend the limits set by nature, the men and women who have known liberty and the inner freedom of the mind are as they and their fathers were. They still feel "the vital warmth at the heart of civilization," which is what Professor Collingwood means by religion.

The first question I raised was whether it is possible that a creed should be a great religious inspiration however poor its content. In this respect the case of Fascism and Nazism as presented by Professor Collingwood (page 173) would seem to be unprecedented in civilized history. All the creeds which have exercised the religious force of which he speaks have possessed some true founts of inspiration, some noble aspects. In Professor Collingwood's account there is nothing of this. How has this poor patchwork of ideas, some of them (e.g. the racial thesis) not even believed in by their prophets, which may seem to have been collected on account of their negation of the ideals of the best men in all ages, achieved the conquests over vast populations which he ascribes to it? The only explanation he offers is that of the abandonment of liberal or democratic principles in Italy and Germany, for special causes. Besides this negative ground there is also the emotional appeal of an unextinguished pre-Christian religion. But how has this suddenly grown so great? There comes to one's mind the parable of the unclean spirit who returned to the house whence he came out, and found it swept and garnished. "Then he taketh with himself seven other spirits more wicked than himself, and they enter in and dwell there: and the last state of that man is worse than the first."[1]

It seems presumptuous to question explanations of the influence of Nazism

[1] St. Matthew xii. 43–5.

and Facism, which are evidently based on first-hand data. But the difficulties which I might call psychological, and also historical in character, are so great, the incredibility of the view that from these sources there could flow an inspiration religious in its intensity and value, that I prefer interpretations of a different kind offered by observers who also know Germany, and some of them Nazism intimately. (I do not here refer to Fascism about which I have read and heard much less.) I incline then to the belief that the only genuine emotion to be reckoned with is that of patriotism, which is no doubt of special strength in Germany. This has been maddened, misused, and associated with other and debasing emotions by the demonic skill and unscrupulous methods of leaders. There is also presumably amongst a large section at least of the youth, that adoration of the Leader to which Professor Collingwood refers. I need not enumerate the well-known modern methods of influencing the mind of a people, which create to-day a state of affairs, I believe without parallel in former times, and even conjure up the phantom of religious enthusiasm.

In regard then to Nazism, my contention is that there is nothing in it which merits the name of religious inspiration (though it may counterfeit this), however widely the expression is understood. There is an unbridled passion to forward the interests of Germany, but what inspires it is not truly religious in character, except in so far as the patriotic core which can be distilled from it may be so called. H. D. Oakeley.

(This completes the discussion.—Ed.)

PHILOSOPHICAL SURVEY

PHILOSOPHY IN ITALY

THERE is not only historical and archaeological interest, but a philosophical interest as well, in the history of the religion of ancient Rome recently published by Turchi.[1] It is in two parts. The first is of an institutional character, dealing with the elements of the Roman cult, private and public, the various indigenous divinities, and the principal manifestations of Roman life connected with the religious tradition, such as the games, sacrifices, the calendar, and so on. This part is of particular interest to students of archeology, providing rich material divided up and arranged in its fundamental elements. The second part will interest students of philosophy, and deals with the historical development of the Roman religion from the origin of civilization to the triumph of Christianity. We are shown here how the first indigenous beginnings of religious feeling became gradually overburdened with experiences, myths, and conceptions arising out of different traditions, in proportion as the orbit of the Roman world increased, with the final result that the primitive nucleus was overpowered, just as Rome herself became submerged in her provinces. These were the principal stages of the process: the penetration of Greek divinities into the Roman world, who with their bolder and more brilliant forms insinuated themselves into the bare outlines of the native deities; the introduction of Greek and Hellenistic philosophy, particularly in its Stoic and Neo-Pythagorean formulations, which transformed the religious and ritualistic relationship of the people towards their gods into an individual and soteriological relationship between man and God; and finally the invasion of oriental cults which brought with it a feeling of feverish and unhealthy mysticism, foreign to the original spirit of Roman religion. The cult of the emperor, which Turchi describes in its minute particularities, and which, he claims, stirred up resistance from the centre of the empire to its confines, failed in its function through the very fact that it derived its origin and force from the religious spirit of the East.

In conclusion, Turchi clearly illustrates the reasons for considering the proper religion of the Romans as having already declined towards the end of the republic in the following manner. The religion of Rome was born to respond to the needs of a *civitas* enclosed in the circumference of its walls; so that, as the confines of Rome extended further and further, so the religion showed itself to be insufficient, and was forced to undergo a change, assuming characteristics to render it acceptable to everyone. Moreover, it was a religion conceived by a people who had developed the juridical instinct above all others, and who were disposed to conceive juridically rather than mystically the relationships between man and divinity. On the other hand, with the entry of Hellenism an entirely new spirit succeeded in individual family and public life, which in its turn demanded a more individual definition of religious relationships. The cultured classes satisfied this demand with Stoicism, which "makes it seem a moral duty to maintain the relation between the individual and the universe, putting oneself in a subordinate position with regard to the whole"; or with Pythagoreanism "which was made for mystic

[1] N. Turchi, *La religione di Roma antica*, Editore Cappelli, 1939, 8° pp 412

minds who were not satisfied with pure speculation, but who, deeply sensitive of the conflict between matter and spirit, sought to heal it by the practice of an asceticism which had for its ultimate object the apotheosis of the soul." As for the common people who could not attain to mystical visions or philosophical conceptions, they found the satisfaction of their religious needs in the hospitable cults of the East.

Thus the old traditional religious deposit was abandoned by the learned and the unlearned, by the patricians and the plebs, who all, through differing motives, felt the need and had the expectation that something new should arise.

Carbonara devotes two volumes to Plotinus[1] in which he attempts a purely systematic reconstruction of the Plotinian philosophy, without any reference to its historical and cultural formation. Perhaps in dealing with a work of such vast breadth a broad introduction would have been useful on the lines of those which in earlier days made the monographs of Ravaisson and Vacherot so suggestive. The author prefers, however, when the opportunity offers, to resolve in the text the problems of the relations between Plotinus, Plato, Aristotle, the Stoics, and the Neo-Pythagoreans. This makes the exposition more closely knit but gives it a certain aridity. The author has chosen to arrange the matter in the ascending order—that is to say, from the world to God. The individual stages are: matter, sensible nature, the soul, thought, the One. Actually in the *Enneads* there is a double order, ascending and descending: that is, a first process (which we might call gnoseological) through which human thought must go to be purified of all material and sensible dross in order to ascend to the One; and a second process (which being ontological takes precedence in the order of things) through which the various grades of intelligible and animated reality emanate from the One. The author's arrangement is simpler but runs the risk of giving insufficient relief to the distinction between what is descending and what is ascending in each hypostasis. Thus for example in the Plotinian conception "thought" takes on a different character (which escapes the author) according to whether it is considered a step to be surmounted in view of the mystical ascent towards the One, or an ontological division of the undifferentiated and ineffable Unity.

As far as speculative appreciation of the Plotinian system is concerned the author justly reacts against the tendency, represented particularly by Max Wund, to make Plotinus a spiritual guide rather than a doctrinaire, a mystic seer rather than a philosopher. Indeed, for the author "Plotinus is perhaps the most systematic and ordered of the philosophers of any time," and he gives proof of it, showing the strict derivation of his problems and of his procedure from Platonic-Aristotelian speculation.

Again, the other *vexata quaestio*: whether the Plotinian conception is a dynamic Pantheism or an emanatism is resolved by the author judicially in the sense that it contains something of each, or better, that it has leanings towards the one and towards the other, while it endeavours to surmount them both. There remains, however, remarked by the author, the sense of a conflict between the idea of an effective descent of the One in the world, which gives a dynamic value to the system, and the fact that the hypostases are immobile and immutable. "Life, always superabundant, acts so that from one hypostasis the other is generated, but the act of this generation is already real in the eternal, so that the different hypostases are present together and coeval, and none of them is ever moved to descend from its proper place and to give life

[1] C. Carbonara, La filosofia di Plotino, Vol. I, *Il problema della materia e del mondo sensibile*; Vol. II, *Il mondo delle cose umane e delle ipostasi eterne* ,Perrella, Roma, 1938, 8°, pp. 139, 378.

to that which was not before. The process of generation serves to indicate rather the hierarchic order of reality, its weakening with the withdrawing from the One; and if one says *descend, withdraw,* one uses a figurative language, suitable to give, through the image of spatial and temporal movement, the idea of the diversity of value among the moments of being."

Finally, there are some very just deliberations by the author on the "Greek," that is the objectivistic, character of the Plotinian divinity, which does not allow reciprocity of relations and feeling between it and humanity.

GUIDO DE RUGGIERO.

(*Translated from the Italian by Constance M. Allen.*)

NEW BOOKS

The Nature of Thought. By Brand Blanshard. (London: George Allen & Unwin, Ltd. (Library of Philosophy). 1939. 2 vols. Pp. 1174. Price 32s.)

This is a remarkable book. In two volumes, comprising some 1,200 pages, Professor Blanshard of Swarthmore College develops about the nature of intelligence an unitary thesis which embodies a critical synthesis of psychology, epistemology, logic, and metaphysics. To describe his undertaking in a necessarily inadequate sentence, he starts from the problems of Locke and concludes in the doctrines of Bradley and Bosanquet.

In his preface he narrates how his book was begun in response to a request to supply a synoptic account of the lessons taught by the various schools of psychology about the relations between intelligence and other mental functions, and how it was then forced to expand into a general philosophy of the understanding, and thence into a general metaphysic. For cognitive acts and dispositions cannot be described without reference to the fact of their being the cognizings of objects. The fact that thought encompasses things is an essential part of the nature of thinking and of things. So the full acount of the tasks of intelligence is in the gift not of empirical psychology, epistemology, or logic but of metaphysics.

The central doctrine of the book is that thinking is purposive. No non-teleological account of intellectual operations can explain them, since what they are is determined by what they are after. Mechanistic, behaviouristic, representationist, and pragmatist theories necessarily break down, for they cannot do justice to the cardinal fact that in this domain the bull's-eye controls the aim. It is not by coincidence or miracle that intellectual processes are often wholly or partly successful. They are internally governed by their own safeguards against failure. We know what we are looking for, how to conduct the search, and how to recognize our goal. Psychologies based on efficient causation must give place to a psychology based on final causation.

If the goals of thought are achievable then, they must not be supposed to stand to it, as they are supposed by many theorists, in the relation of the absent sitter to the portrait, or that of the carrot to the donkey. Nor, since seeking is not finding, can they stand to it in the relation of Hamlet to the Prince of Denmark. Rather, Professor Blanshard argues, the goals of thinking processes stand to them in the relation of the oak-tree to the acorn or the adult to the adolescent. The nisus of thought is towards unification of itself with that which it would grasp. Our thinkings are the never consummated coming-to-be of reality. An "idea" is not the replica of a reality, or the promise of one; it is the nascency of it.

This somewhat mysterious Nirvana doctrine explicitly requires the theory of internal relations, the coherence theory of truth, monism, the assimilation of causal to logical necessities, the discarding of abstract universals in favour of the concrete universal, and the identification "in the end" of truths of fact with truths of reason. Now this summary account of Professor Blanshard's ultimate conclusions will probably provoke in the minds of modernist philosophers the suspicion that the book is nothing but an aftermath of Edwardian Oxford. Will Mrs. Micawber never desert her Bradley, Bosanquet, and Joachim? Must the flotsam of the Isis still cumber the joint waters of the

Danube and the Cam? But if such critics will read *The Nature of Thought*, they will, if honest, withdraw their pity even if, with the reviewer, they withhold their agreement from its final tenets. For Professor Blanshard betters his instructions in two important ways. He writes far better philosophical prose than did any of his teachers, save perhaps Bradley. He writes with a felicitous combination of dignity, pungency, and ease, avoiding both journalese and pedantry. The book can be read with pleasure and with comprehension. And, what is even more important, he reasons cogently and many of his arguments are new. A theory armed against definite objections and itself on the offensive against recent rival views is different from, though a child of, a theory which was still obnoxious to those criticisms and unalive to the claims of those rivals. Even if it is Bosanquet's mansion that the author is fortifying against Russell, Moore, Wittgenstein, Carnap, Ayer, James, Watson, Dewey, Titchener, and the Gestalt School, it is certain that the new building is very different from the old dwelling.

The argument of the book contains two main movements, which can be fairly clearly distinguished, though they overlap and interlock in various ways. Namely, in some stretches Professor Blanshard is primarily discussing epistemological questions or questions belonging to the philosophy of psychology, while in other parts he is primarily arguing for certain metaphysical conclusions. In both movements he combines destructive criticism of other theories with constructive alternatives to them; in the epistemological chapters he sifts such theories of knowledge as those of Locke, Berkeley, Hume, Broad, Price, Russell, Moore, the critical realists, associationists and behaviourists, and in the more metaphysical chapters he attacks certain logical, logistical, and anti-metaphysical doctrines of Russell, Moore, Lewis, Wittgenstein, Ayer, and others. Of course it is his cardinal thesis that these two movements stand or fall together. The ammunition with which he blows up, say, the image-train theory of thinking comes from the armoury of his metaphysics. A success for one is a success for the other. Yet, though this interdependence is claimed and argued, I think that it must and can be rejected. I think that the metaphysical movement is radically misguided, unless subjected to a modification which the author would not tolerate. On the other hand, I think that the epistemology is good and often masterly. And if so, they cannot be stages in the same journey.

To accept and applaud the author's criticisms, while rejecting their canons, looks like taking his paper but spurning his gold. But perhaps this eclecticism can be justified.

Professor Blanshard discusses the functions of intelligence in the following stages. He begins by considering the thinking which enters into unreflective perceptual recognition ("acceptance" and "assurance"); he then passes to the more primitive sorts of "thinking-of in absence," and thence to reflective search, invention, and abstract theory. At this last stage there becomes explicit and self-conscious what was only latent in the earlier stages—the control of our cognitive operations by the demands of "system." Identifying —I think erroneously—the notion of "system," in terms of which we should describe a good scientific theory as systematic, with that in which we should describe a good philosophical theory as systematic, he argues that all thinking aims at one sort of system and is guided by one ideal of truth, namely coherence. A theory is true when it is coherent, and for it to be coherent it is necessary and sufficient that it be omni-comprehensive and totally internecessitating. There can be no place here for any merely contingent truths; all truths will be truths of reason, and all relations will be internal relations. And the fences will be down which now seem to separate the empirical

sciences, mathematics, logic, and metaphysics. For all questions are ultimately the one question "Why?" and all discoveries are ultimately alike in being explanations or approximations towards *the* explanation.

I shall argue later that there are irreducibly different types of questions, so that in an important sense empirical inquiries are not continuous with mathematical inquiries, or either with philosophical inquiries. Consequently the open-sesame word "system" has irreducibly different meanings. There is one sense in which a good scientific theory is systematic, another in which mathematics should be systematic, and a third in which philosophy requires to be systematic. But there is no further sense in which all will be members of one system, in such a way that a forward step in philosophy will advance chemistry, say, or topology, or history. Professor Blanshard is operating with one notion of system in his investigation of the rôle of intelligence in our nursery and laboratory explorations of the world, and with quite another in his investigation of its rôle in philosophical thinking. He says much that is true and important in both investigations, but he identifies them just where their differences become crucial.

In the first volume the author concentrates on the task of exhibiting the workings of unreflective intelligence in perceptual acceptance and assurance and in the formation and exercise of concepts in the more primitive sorts of thinking-in-absence. His argumentation here is chiefly critical. He moves, that is, by exposing the defects, while preserving the rather scanty fruits of leading theories which have been held or are now held upon the topic. Associationist, behaviourist, and pragmatist doctrines are explored and refuted, together with dominant varieties of Realism and Critical Realism. The refutations, which are generally both radical and conclusive, consist partly in demonstrations of the internal self-contradictoriness of the doctrines, and partly in showing that if these theories were true there could be no place for truth, error, correction of error, or precaution against error in such cognitive states as perception, memory, and expectation. Empirical observation, introspective or sensible, together with knowledge of efficient causal laws, necessarily fails to reveal the essential properties of the operations of intelligence. Not that the author denies the facts which the practice of "phenomenalism in psychology" reveals. Image-trains do occur in the course of some thinking; words, voiced and unvoiced, and bodily behaviour, as well as dispositions to image, say and act, often are the empirical manifestations of thinking. But to equate thinking with any of these or with any conflation of these is to deny that thought is—what we know it to be. There is implicit inference present already in the most unreflective acts of perceptual acceptance. It is inference, for it is passage beyond what is given and a passage which is not merely associative, since the passage may be a mistake, which an association cannot be; but it is implicit in the sense that we do not articulate our premisses or our rules of inference. Here the author controverts well-known arguments of Broad and Price.

This part of Professor Blanshard's argument, which occupies the greater part of his first volume, seems to me to contain by far the best examination and criticism of Humian and neo-Humian epistemologies that have yet been produced. For some of it, indeed, he claims indebtedness to such forerunners as T. H. Green, Bradley, and Joachim. But the dividends on these loans suggest that at least the borrower is an exceptionally sagacious investor. For he is successful where they, he filially protests, should have been successful. In what does his success consist?

If we consider the various sorts of theories which he criticizes, such as the theories that thoughts are concatenations by association of images with

images, or of image-groups with feelings, or that thoughts are conditioned concatenations of laryngeal movements, or routines of profitable behaviour, we notice that these are not psychological hypotheses. They are theories about psychology, not theories in psychology. For they belong to the reflections of philosophers or of psychologists philosophizing about the methodology of psychology. They record not the results of the psychologists' empirical researches, but the canons of their methods. For example, some philosophizing psychologists aver that all empirically ascertainable facts about thinking are facts about images and the routines of their occurrence, or that all empirically testable hypotheses about thinking are hypotheses about routines of observable bodily behaviour. But the resultant assertion that the occurrence of a thought *is* the occurrence of an image-train or behaviour-complex is not the assertion of an empirically verifiable or falsifiable proposition. It asserts a philosophical proposition—and a false one. For it says that we *mean* by "thinking" some such image-train or behaviour-complex, so that there would be a contradiction in allowing that such an image-train or behaviour-pattern had occurred without the subject thinking or vice-versa. And there is no such contradiction.

We mean by "thinking" something characterizable as "mistaken," "correct," "fallacious," "valid," "judicious," "silly," and the like, and it is just a bad philosophical theory which says or implies that all such predications are improper. Now the core of Professor Blanshard's criticisms of associationism, behaviourism, pragmatism, and the rest lies in his proofs that these theories do entail this absurd conclusion. And when he asserts that thinking is purposive, he too is not advertising a newly verified inductive hypothesis: he is showing that these predications are proper.

But it is one thing to show what "thinking" means, and quite another to advance the natural history of thinking. Even a philosophically enlightened psychologist has still to discover empirically when thinking occurs, what facilitates, impedes, trains and hampers it; how its effects differ from those of mere image-trains, and so on. Even if it is a philosophically important point to say that thought is purposive, this will not restore final causes into the methodology of psychology or eliminate efficient causes from it. For the tests of whether a given mental process is or is not fully or embryonically intelligent must still be observational, experimental, and inductive. Philosophical arguments cannot decide whether the behaviour of the ape, the infant, the lunatic, and the politician is or is not intelligent. How is the psychologist to *use* the philosophically clarified concept of intelligence in solving this factual problem? What is the empirical evidence that in this particular case the bull's-eye is controlling the aim?

Now these questions are not insoluble, and the fact that they are soluble proves the important point that a philosophical account of intelligence is not a substitute for psychology and cannot be described as preferable to either a bad or a good psychology. It answers quite different questions. Professor Blanshard explodes a number of tempting absurdities in the philosophy of psychology, but he does not, unless *per accidens*, contribute to the establishment of any psychological laws. But if such laws can be empirically established, the philosophically rectified criteria of the presence or absence of intelligence and of different degrees of intelligence or stupidity must be applicable in observation and experiment. The notions of "purpose" and of "nisus towards system" must be empirically cashable, else they will enter into psychology only as "idle wheels." Professor Blanshard shows well that certain working wheels are missing from other philosophies of psychology; but I do not find that he succeeds in showing how his own new wheel actually works. By what

tests should the teacher decide whether or not William was really or purposively thinking when he said or did so and so? For of course he *can*, in principle, decide such questions.

In the second volume the author begins by discussing the principles governing the formation of more or less general theories, such as theories about parts of Nature and theories in branches of mathematics. Here he is in the main trying to extract the canons of good inductive theories, though he tends to obliterate the important differences that exist between the canons of inductive and those of mathematical reasoning. The search for causal necessities or laws to explain observed conjunctions is indeed governed in some sense by knowledge of what is being looked for, and the ability to conceive and later to establish special laws involves the present ability to apply methods of measurement, canons of correlation and rules of evidence to new fields. So in a special sense we can say that the idea of system is in active control of our researches. But the author elides too easily the important facts about induction: (1) that its inferences are necessarily probable inferences, (2) that special laws of Nature are in principle undemonstrable from *a priori* premisses, and (3) that the fact that some conjunctions can be discovered to be examples of laws does not entail that all or most *de facto* conjunctions are so; and actually, unless the vast majority of *de facto* concomitances were fortuitous, there would be no hope of discovering any special natural laws. Natural knowledge has no tendency to assume the (I think itself spurious) form, beloved by Professor Blanshard, of a system of propositions each of which entails and is entailed by each of the others. He himself is forced to concede that there are different degrees of necessitation, relevance, and, I think, internality.

This, however, is the culminating doctrine of the book, that coherence is both the criterion and the nature of the truth of all sorts of thoughts whatsoever; that coherence is the inter-necessitation of thoughts in a rigorous all-way deductive system, that all terms are internally related, and all their relations are internal relations; and that this is the bull's-eye controlling of even the most primitive operations of intelligence. His defence of the course this view involves the author in expounding and criticizing both empiricist denials of logical necessity as well as latter-day restrictions of it to the special domain of "formal," analytic or linguistic truths. (Some of his criticisms on special points have a good deal of force.)

Only such a single, comprehensive system of inter-necessitations would completely satisfy the intellect, so theories which do not realize this ideal are not true, but at best aspiring towards truth. "Intelligible" seems to be (implicitly) defined in terms of the knowledge of necessitation. I fail to see why, for non-necessitations seem to me understandable if necessitations are so. But anyhow this is not one of the normal uses of "intelligible," so the author seems to be arguing from an arbitrary definition of his own.

Now why does Professor Blanshard crave to impose this queer and unrealizable logical pattern upon all good theory? For if, as I think, his requirement is baseless, there must still be some powerful intellectual motive for his making it. Intelligent thinkers do not bark up wrong trees by accident or from caprice. I suggest that a part of the motive is this. He knows from experience what philosophizing is like, and what are the marks, sources, and products of mistakes and inadequacies in philosophic theory. And he then extrapolates to non-philosophic theories and imputes the same canons and criteria to them. He assumes, that is, that all theory is continuous with philosophic theory, as if Kant, say, stands to Newton as Darwin to Linnaeus or Riemann to Euclid.

For it is true that in philosophic theory there is no place for merely probable argument, that there are no completely insulated departments, that mistakes and inadequacies are, spring from and lead to logical absurdities or incoherences. In this domain the "relations" between the "terms" under consideration are internal. If philosophy can be vaguely described as the charting of concepts, the connections between concepts cannot be described as contingent.

But to extrapolate from these important, if nebulous, properties of philosophic theory to the properties of such theories as chemistry, history, and arithmetic is to assume that all theories are answers to questions of one type. And this is not true. The objects, with their relations and laws, which constitute the subject-matter of astronomy, differ from those of algebra, philology and philosophy not in species or genus but in type; the words "object," "relation," "law" (and "system") are used in typically different ways. When we speak, as we may, of the internal relations between concepts, we are employing a different sense of "relation" from its use in our discussions of the "relations" between planets or the "relations" between numbers. And so on. So there is no such question as "are all relations internal or all external?" The word "relation" is typically ambiguous.

If, then, philosophical theory is not in the required way continuous with theories of other sorts, the criteria of success and failure in it will be, as they are, different from the corresponding criteria in the other types of inquiry. And this is quite consistent with the admission that philosophical theories are intrinsically tied up with mathematics, natural science, history, jurisprudence, theology, psychology, pedagogics, and the rest. Philosophers' problems do indeed arise out of the progresses and difficulties of other investigations—but not in the way in which adolescent physics, say, transmits unsolved problems to adult physics. Philosophy does not supplement or complete the sciences, but it does in quite another way rectify them.

Professor Blanshard will, I fancy, think that he has put up an adequate barricade against this line of criticism. For he holds, I believe, that such pretended discriminations of types of questions, propositions, objects, terms, relations, etc., tacitly presuppose a false doctrine of "abstract universals." And this doctrine is vigorously attacked at the end of his first volume. But the doctrine which he there attacks, and to which he prefers a mysterious doctrine of "the concrete universal," seems to be the theory, which has surely never been held by any considerable philosopher, that generic attributes are independent of specific attributes, i.e. that ". . . is coloured" is compatible with ". . . is neither blue nor green nor red, etc." On any showing some general and even very general propositions are known by us to be true without our knowing which of the more specific propositions covered by them is true, and it is the possibility of this chiefly which is presupposed by the discrimination of types of questions.

In conclusion, I think that Professor Blanshard's contribution to epistemology or the philosophy of psychology supplies a much-needed and effective medicine against a number of popular philosophical maladies, but I am sceptical of its dietetic value. His writing has a spaciousness and wisdom in it which have been missing from recent philosophical literature. It is meant to be a testimonial to his book to say that it makes one nostalgic for its author's frame of mind at the same moment that one wishes to persuade its owner to migrate.

GILBERT RYLE.

The Ways of Things: A Philosophy of Knowledge, Nature and Value. By W. P. MONTAGUE. (New York: Prentice-Hall Inc. 1940. Pp. xviii + 712. Price $4.)

Mr. Montague is a leader in contemporary American philosophy, and he won that position many years ago. He has written books, but his high reputation depends just as much upon his able, careful, readable, jolly, imaginative essays and addresses. The present volume contains most of these —the cream of them, or, as they say in the trade, their double-cream. As such, its importance is above question. It rescues and arranges work that is either hard to come by or too lonely to have its full effect.

In its form the volume has two parts, the first being an "Introduction to Philosophy," the second consisting of "Experiments in Philosophy," that is to say consisting of the essays and addresses mentioned above, duly arranged in logical, not chronological sequence in such a way as to test and to illustrate the various arguments of the first part. The first part occupies about a quarter of the whole.

The first part begins as one would expect an "introduction to philosophy" to begin. In other words, it starts off as if it were meant for beginners. Indeed, the condensed account of formal logic that is given at the outset seems a little odd on any showing, since elementary text-books on that subject are within the reach of most beginners. Very swiftly, however, and I think very happily, the author changes his mind and gives us an introduction to his own philosophy instead of this beginner's stuff. The beginner is forgotten, although, since Mr. Montague applies all his briskness and all his skill, I suppose a general reader could make quite a lot of it. It is a pity, I think, that some of the outward semblance of a manual has been retained—for example, sets of examination questions at the end. The book isn't a text-book and shouldn't pretend to be. The introduction is not less technical than the experiments, and although a few of the experiments were composed for a popular audience, many of them were written for American or international congresses, for the Aristotelian Society and for other bodies which, if they are not really learned, expect to be treated as if they were. All the essays are lively, but none of them insults a difficult subject by talking down to slippered ease.

Taken as it should be taken, Part I is an exhilarating and valuable sketch of an exhilarating and valuable philosophy, the fruit of constant excogitation of a wide field, of a genius for centrality combined with unusual ingenuity in certain bypaths, and of remarkable skill in adapting the way of writing to the topic in hand. Fable and allusion and even rhyme are all at Mr. Montague's service when he needs them.

The Experiments in Part II might be said, rather grudgingly, to be chips from a carpenter's block, or, rather fulsomely, to be sweepings from a goldsmith's table. For myself I would say that Mr. Montague is a first-rate silversmith in philosophy, and I mean the comment to be high praise. Setting eulogy and metaphor aside, I shall remark soberly that there are twenty-two of these pieces (two of them subdivided), that they are grouped under the headings of Logic, Epistemology, Metaphysics, Theology, Ethics, and Aesthetics, and that they are rounded off, half autobiographically, by Mr. Montague's account of himself in the American volumes of *Selbstdarstellungen*. In their dates the experiments range from 1904 to 1937, and very few are altered at all. Indeed, it would seem as if Mr. Montague, when he gets the length of print, wants the printed page to stand for the rest of his life. That is an unusual but refreshing attitude.

Mr. Montague describes himself as an animistic materialist. We might add that he is a noëtic, moralistic, and theological materialist. His epistemology

is but the gateway to his metaphysics, not the basis of it. He finds room for ethics and for aesthetics, providing each with cards to show that they have paid for their accommodation. But the central and most interesting part of his work is the metaphysical part.

As a materialist Mr. Montague holds that everything, including the human mind and God, is a spatial entity functioning in a single physical universe. Life and mind, then, if they are genuine, must take their place in the physics of things. Mr. Montague is assured of their genuineness, partly from his own invincible experience of his own mind, partly because mental and vital properties are distinctive and are discoverable in other than merely introspective ways.

His interest in modern physics itself is shown, e.g. in ingenious discussions of the relativity and quantum theories with elaborate specific suggestions for laboratory experiments to settle the truth of them. That is enough to show that he is in earnest with his physics, more than a mere outsider in the subject, working towards a theory that is thick and precise, not vague and thin. It is in this spirit that he gives his version of emergent evolution (or of a growing God) and contends that consciousness may very well be, and must be, a form of energy. Physics, he says, uses and requires the notion of potential energy. May we not, should we not, hold that the energy that is only "potential" for an outside observer is itself an intensive actuality? Is not sensation almost certain to be just that intensive actuality? If so, why should we boggle at the reasonable view that the specifically mental properties of responding to what is absent, of storing the past, and of developing teleologically are forms that intensive energy may assume, develop, and stabilize? Personality, even divine personality, on a cosmic scale may very well *be* this hierarchy, and in the case of human beings it is not impossible that the intensive pattern of their energy should be capable of physical and personal persistence after death. I am sorry that I have to speak briefly and generally of an argument that owes its attractiveness and its principal motives to credence (such as they are) to its sedulous pursuit of detail. I want to suggest to the reader that he ought to study this book slowly.

Mr. Montague is a Platonic as well as an animistic materialist. In a very stubborn part of him, he believes in eternal essences or values which subsist without existing, which are possibilities that encompass the actual, and in the end determine and even produce the actual itself. This part of his metaphysics is perhaps harder to accept than the rest, and it seems to me to be more sketchily argued, as well as to be less willing to meet the many objections that can be brought against it and are rather familiar since the days when it was fashionable to regard subsistence and existence as twin species of "being." For my own satisfaction, I should like to have heard more about the link, if there is one, between the view that "values" are functions of our likes and dislikes on the one hand, and on the other hand the firm assertion that they are eternal essences and the true foundations of the world. But, very likely, I have missed something just under my nose.

I hope I have made it clear that I think this book worthy of wide and of close attention. I should add that the variety of its interest is astonishing. Anyone who is curious about the history of American realism would go to Mr. Montague before going to any other. Anyone who is fascinated by the conception of a spiritual type of materialism would do well to give many days and nights to Mr. Montague's pages. That is part of what I mean. But the book abounds in sideshows that are also very beguiling. There are, for instance, Mr. Montague's opinions about democracy and world affairs, his scheme for a capitalistic and a communistic society existing together in harmony in the

same political region, his Promethean attitude towards clericalism despite or because of his theism, his views about art and the good life. In a narrower way he has a definite point in all the minuter matters that he handles, such as a defence of the greater dignity of certain "pleasures" not in respect of quality but in respect of dimension. In all such cases he is stimulating, because to a quite unusual degree he always has something to say.

JOHN LAIRD.

Philosophy for our Times. By C. E. M. JOAD, M.A., D.Litt. (London: Thomas Nelson & Sons, Ltd. 1940. Pp. vi + 367. Price 7s. 6d. net.)

Mr. Joad's philosophy for our times is a mild version of the self-styled philosophy for all time—to wit, *philosophia perennis*—plus some references to the contemporary moral and political situation. His book lacks the verve of some of his earlier productions, notably of *Return to Philosophy*, which in subject-matter it overlaps.

Having polished off science in a very unsympathetic manner on the grounds that it cannot ask *why*, that it omits mind and omits value, Mr. Joad disposes of subjectivist theories of value and purports to prove their objectivity. He then re-refutes hedonism, draws from Plato and from Aristotle a plan for the right conduct of life and concludes with a few criticisms of the totalitarian states and of the maldistribution of wealth. In parting he compliments democracy and the values, adding a postscript apology for his failure to adopt Christian theism.

His arguments about values put me in mind of Hume's remark to Boswell that "he had never entertained any belief in religion since he began to read Locke and Clarke." One in particular described as "purely logical" runs—unless I misunderstand it—as follows: Mr. Joad is *discussing* the proposition " 'This picture is beautiful' means the same as the sentence 'this picture arouses pleasure in me.' " But if the proposition is true, it is a tautology and therefore cannot be discussed: yet Mr. Joad is discussing it, therefore it is false and (the author hurries on) beauty is not " 'in the eye of the beholder'; it is a property of things which the mind recognizes and welcomes as being in some way akin to that which is best in itself . . ." (p. 189). "Almost," one might say, " thou persuadest me to be a logical positivist!"

How far the "objectivity" which Mr. Joad asserts of truth, beauty, and goodness is to be read of happiness, his fourth ultimate value, I cannot say. A non-subjective happiness seems somewhat odd. Indeed, I venture that happiness, as a co-equal value, would appear to have been dropped into Mr. Joad's mixture to sweeten an otherwise austere recipe and to fit it better for "our times."

RALPH E. STEDMAN.

Books received also:—

R. G. COLLINGWOOD. *An Essay on Metaphysics*. Oxford at the Clarendon Press, Humphrey Milford. 1940. Pp. x + 354. 18s.

E. S. WATERHOUSE. *The Christian and Modern Philosophy*. London: The Epworth Press. 1940. Pp. 24. 4d.

C. B. GARNETT, Jr. *Wisdom in Conduct: An Introduction to Ethics*. New York: Harcourt, Brace & Co. 1940. Pp. xv + 458. 2 dollars 50.

D. Bidney. *The Psychology and Ethics of Spinoza: A Study in the History and Logic of Ideas.* London: Oxford University Press, Humphrey Milford. 1940. Pp. xv + 454. 22s. 6d.

K. Mannheim. *Man and Society in an Age of Reconstruction.* London: Kegan Paul, Trench, Trubner & Co. 1940. Pp. xx + 469. 16s. 6d.

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H. A. Mess. *Social Groups in Modern England.* London: T. Nelson & Sons, Ltd. 1940. Pp. 168. 2s. 6d.

W. Brown. *Psychology and Psychotherapy.* (Fourth edition.) London: E. Arnold & Co. 1940. Pp. viii + 260. 12s. 6d.

W. E. Hocking. *Living Religions and a World Faith.* London: G. Allen & Unwin, Ltd. 1940. Pp. 293. 10s.

G. B. Bentley. *The Resurrection of the Bible* (*Signposts* series). London: Dacre Press. 1940. Pp. 128. 1s.

J. Laird. *Theism and Cosmology.* (First series of a course of Gifford Lectures on the general subject of Metaphysics and Theism, 1939.) London: G. Allen & Unwin, Ltd. 1940. Pp. 325. 10s. 6d.

I. B. Berkson. *Preface to an Educational Philosophy.* New York: Columbia University Press; London: Humphrey Milford, Oxford University Press. 1940. Pp. xvi + 250. 2 dollars 50; 16s. 6d.

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K. E. Gilbert and H. Kuhn. *A History of Aesthetics.* New York: The Macmillan Co. 1939. Pp. xx + 582. 18s.

E. Benzécri. *L'Esprit Humain selon Pascal.* Paris: Alcan. 1939. Pp. 179. 40 frs.

E. Benzécri. *Essai sur la Nature et la Portée de l'Attitude Métaphysique.* Paris: Alcan. Pp. vii + 145. 30 frs.

E. Oggioni. *La "Filosofia Prima" di Aristotele. Saggio di Ricostruzione e di Interpretazione.* Milano: "Vita e Pensiero." 1939. Pp. xii + 207. Lire dodici.

M. Campo, *Cristiano Wolff e il Razionalismo Precritico.* Milano: "Vita e Pensiero." 1939. Tomo primo: Pp. xix + 389; Tomo secondo: Pp. xii + 393–684. Due tomi: Lire cinquanta.

S. Vanni Rovighi. *La Filosofia di Edmund Husserl.* Milano: "Vita e Pensiero." 1939. Pp. viii + 173. Lire quattordici.

Opere Complete di Giovanni Gentile. Il Pensiero Italiano del Rinascimento. Terza edizione accresciuta e riordinata. Firenze: G. C. Sansoni. 1940. Pp. xii + 432. Lire 35.

G. Calogero. *La Scuola dell'Uomo.* Firenze: G. C. Sansoni. 1939. Pp. viii+259. Lire 20.

Summa Gramatica Magistri Rogeri Bacon necnon Sumule Dialectices Magistri Rogeri Bacon. Nunc primum editit Robert Steele. Oxford: Clarendon Press, Humphrey Milford. 1940. Pp. xxiv + 369. 30s.

Humanidades. Tomo XXVII: *Letras.* (Director: A. D. Calcagno.) Universidad Nacional de la Plata, Republica Argentina. 1939. Pp. 550.

CORRESPONDENCE

To the Editor of *Philosophy*

Sir,

In his witty review of Professor Urban's *Language and Reality* Mr. Ryle remarks that not all words are names and that most propositions are not simple singular attributive ones. "If all words were names in the same way," he says, ". . . 'unless to-day is Thursday, I am mistaken,' would be an inventory of entities." Now—to simplify the example and avoid supposition—proposition complications—is "to-day is Thursday" divisible into three words? A word means what you mean by it only in its context, as Professor Urban stresses, so that, as Signor Gentile maintains, it is your whole utterance, poem, oration, book, which forms a single word. The words taken in isolation are meaningless, as happens when some public speaker in an effort to make himself clear speaks so slowly that his words become disconnected.

To divide a proposition into separate words is to treat it grammatically, for grammar just is the study which treats thought as an object, splits it up into separate entities standing by themselves, and sets them out as parts or turns of speech in grammar books or lists of words in dictionaries and lexicons. The dictionaries supply examples, i.e. words in a context, when the context is dubious. Thus you expect to find examples given under the word "walk," but you would not take it amiss if you found no examples under the word "amoeba," where the background is without doubt protozoic.

Similarly with the proposition. If you treat it grammatically you first detect the noun at the beginning, call that the subject, draw a line marking off the rest of the words and call them the predicate. If you wish to determine the predicate further, you see whether there is an adjective after the word "is," and that is the subject-attribute (-predicate) proposition. If you find instead a preposition or a verb governing a noun, then you have the relational proposition. If you find after the word "is" a common noun, that is the class-membership proposition. And so on.

Professor Urban, however, does not quite identify subject-attribute with subject-adjective, since he holds that in "A is to the west of B," "west of B" is the predicate of A, and interprets subject and predicate as something to talk about and something said about it. Others who hold the validity of metaphysics take subject-predicate as being existence-essence. In that case the distinction is purely ideal and no concrete example can be severed into two actual elements. Thus, in our previous example, "To-day is Thursday" is the subject and "To-day is Thursday" is the predicate. If you distinguish philosophy from grammar, and understand by "word" the complete utterance and by "subject-attribute" existence-essence, then every word is a "Fido"—Fido and every proposition is attributive (and on the same interpretation "singular" because a synthesis of particular and universal).

This appears to me to be worth emphasizing, because there is a danger of the opposing armies of those who deny and those who maintain that all words are names and all propositions attributive failing to engage in conflict at all, if it is thought that they both mean quite the same thing by "word" and "subject-attribute."

Yours faithfully,

Angus Armstrong.

Edinburgh,
April 1940.

To the Editor of *Philosophy*

Sir,

In Professor Collingwood's article, "Fascism and Nazism," assertions are made which many of us would deny, and which may, I think, be criticized in relation to a principle he has himself expounded.

Liberal and democratic ideas, Professor Collingwood says, are derived from Christianity and owe their emotional drive to Christianity as a religious system rich in superstitious or magical elements. The rejection of these elements has reduced liberalism to a mere intellectual habit, unable to withstand the onset of a movement having behind it the vitality of pre-Christian religion.

The assumption that I wish here especially to question is that the deep emotion religious in character, which alone can inspire and sustain men in action is necessarily superstitious, irrational.

In his extremely interesting *Autobiography*, Professor Collingwood has told us how philosophical problems, later to occupy him, revealed themselves even in childhood as somehow his business, and has described the growth of his later conviction that a logic of question and answer, problem and solution, should be substituted for a logic of propositions, in all researches historical or philosophical.

In my own thought I have realized the importance of Professor Collingwood's principle. The process he describes of being "burdened" with a problem that begins as a "formless disturbance" and takes shape gradually in urgent questions, is a matter of the emotional no less than of the intellectual life. Those of us who genuinely hold liberal or democratic principles hold them, I would maintain, neither as habit nor as merely "cerebral," unemotional thought. Rather they are involved in our intellectual and emotional struggle with problems so deeply rooted within our individual and social life as to be virtually religious in character. If our defence of these democratic principles is weak, the reason, I am convinced, is not because we have rejected superstitions—images, formulae—that once had emotional value but have grown dim and fallen away as our problem took distinctive shape. Our trouble, I believe, is rather that conflicts within ourselves and society obstruct and confuse this struggle of intellectual-emotional thought. We are divided as to how we should identify and estimate the factors of the terrifyingly complex, concrete situation we have to meet. Those who can accept unquestioningly some solution, however disastrously inadequate, imposed by a quasi-divine, paternal authority, escape this perplexity. They are free to pour into the collectively imposed solution the whole "drive" of those vital or spiritual needs which in us remain locked within the urgency of unanswered questions.

I would appeal to Professor Collingwood to reconsider the plight of the democratic thinker in terms of his own concept, of thought as problem solution. Perhaps within those terms he may offer us more effective help in the finding of answers to the questions set by both the intellect and the vital needs of our time.

Yours faithfully,
MAUD BODKIN.

WELWYN GARDEN CITY,
HERTS.
April 1940.

INSTITUTE NOTES

MEMBERS of the Institute will regret to hear that Professor John H. Muirhead, the Chairman of the Council, died on Friday, May 24th, at his home, Dyke End, Rotherfield, Sussex, at the age of eighty-five.

Professor Muirhead became Chairman of the Institute in 1929, and gave himself untiringly to its interests. On several occasions he gave courses of lectures on Ethics, and at many of the Public Meetings of the Institute he presided. Always on such occasions his contributions were penetrating, deep, and wise. As Chairman of the Council, he inspired his colleagues with a lively sense of the important work the Institute was trying to do in promoting a wider knowledge of philosophy; and the unselfish way in which he placed himself at the service of the staff in carrying out the practical details of the Institute's work will always be remembered with gratitude.

OBJECTS OF THE INSTITUTE

The British Institute of Philosophy exists to bring leading exponents of various branches of Philosophy into direct contact with the general public, with the purpose of satisfying a need felt by many men and women in every walk of life for greater clearness and comprehensiveness of vision in human affairs.

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(1) Provides at suitable times in the day and evening courses of lectures by leading exponents in the more important subjects coming within the scope of Philosophy. All branches of Philosophy are represented —Ethics and Social Philosophy, the Philosophy of Law and of the Sciences, of the Fine Arts and of Religion, as well as Logic and Metaphysics and Psychology.
These lectures are free to members.
(2) Issues a quarterly philosophical journal (free to members).
(3) Proposes to form a philosophical Library.
(4) Gives guidance and assistance to individuals in their philosophical reading.
(5) Encourages research in Philosophy.
(6) There are Local Centres of the Institute at Bangor, Cardiff, Liverpool, Manchester, Newcastle and Durham, and Sheffield.

Further information and forms of application for membership may be had on application to the Director of Studies, at University Hall, 14 Gordon Square, London, W.C.1.

[*Suggested*]

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THE BRITISH INSTITUTE OF PHILOSOPHY

Appeal for New Members and Donations

The Council appeals to members to do all in their power to introduce new members in order to extend the benefits of the Institute and to increase its revenue.

The Institute has no endowments, and its work, which includes lecture courses and meetings for discussion in the various Centres, as well as the conduct of the Journal, cannot be carried on from revenue derived solely from subscriptions of £1 1s. per annum. The Council, therefore, appeals for donations, small or large, from sympathizers with the Institute's aims.

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